ENGINEERING NEWS-RECORD

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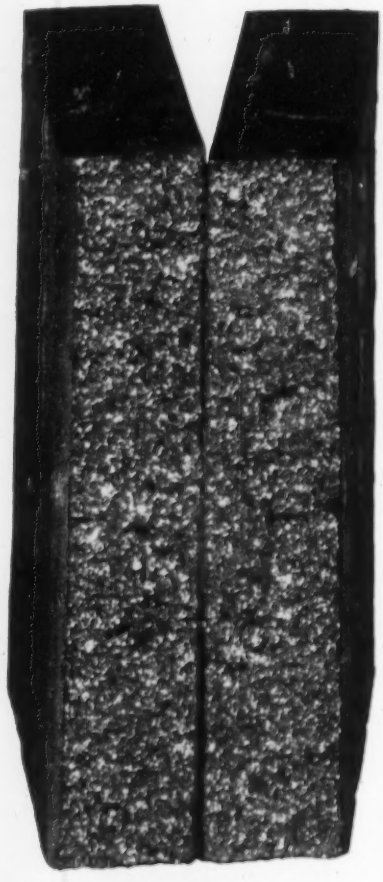
A McGRAW-HILL PUBLICATION

HERE IS THE DIFFERENCE

WROUGHT IRON



STEEL

These are actual photographs of fractured pieces of wrought iron and steel. The picture at the left shows the fibrous structure of wrought iron. How this differs from the crystalline structure of steel is readily apparent. It is the presence of many thousands of tiny threads of glass-like iron silicate that gives wrought iron this unique fibrous structure and it is this structural feature, duplicated in no other metal, that gives wrought iron its superior resistance to corrosion and fatigue stresses.

While the initial cost may be higher, actual service records in numerous applications prove that wrought iron is the most economical buy because it lasts longer. Ask any Byers Field Service Engineer to show you fractured pieces, similar to those illustrated above. Write for our booklet, "The ABC's of Wrought Iron."

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Department: New York, N.Y.

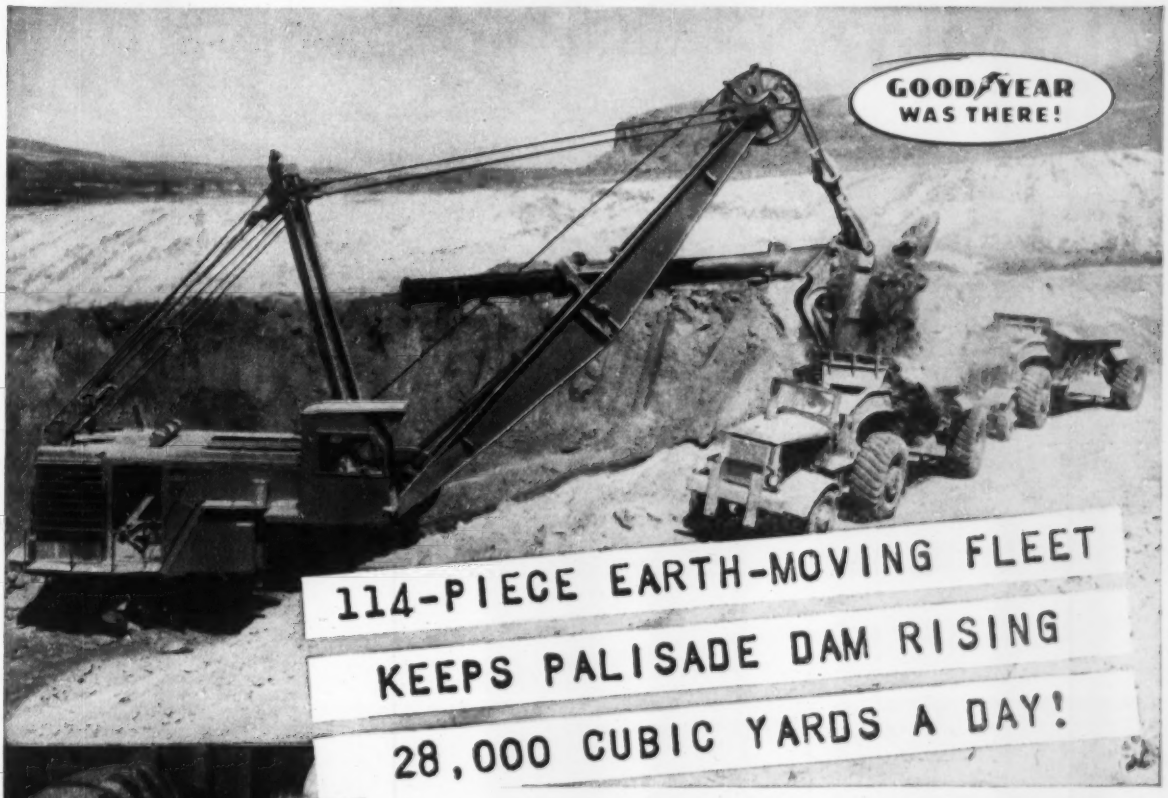
BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY STEEL PRODUCTS



114-PIECE EARTH-MOVING FLEET KEEPS PALISADE DAM RISING 28,000 CUBIC YARDS A DAY!

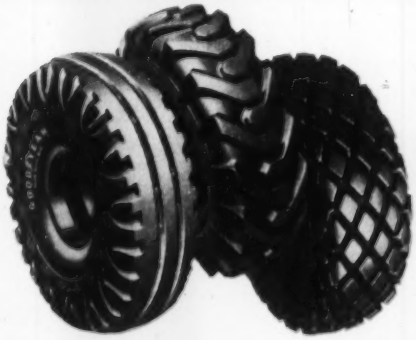
The 13,800,000-cubic-yard Palisade Dam on Snake River, Idaho, will be one of the world's largest earth-fill barriers—260 feet high, 2,200 feet long by 40 feet wide at the crest, and 2,250 feet wide at the base. Wrenching the treacherous Snake River from its bed to a man-made channel (with 60 miles of momentum behind the river) was just one of the problems this job dishes out regularly!

GIANT HARD ROCK LUGS, as all types of tires used on this job, get expert, periodic inspections that save rubber and down time.

Wherever there's a job-for-the-book, GOODYEAR IS THERE. Yes—*all* there—with the right type tire for each job, with the *toughest* tires ever, because now they're built with new, Triple-Tempered (3-T) Cord!

3-T Cord—both Nylon and Rayon—is made by Goodyear's exclusive Triple-Tempering process. It *stays* at its most bruise-resistant, heat-resistant point, controls tire growth, cuts tread and body failures to new lows. Get *all* the facts before you buy or specify any other tire. Goodyear, Truck Tire Dept., Akron 16, Ohio.

GET THEM IN 3-T NYLON
for greatest all-round stamina



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FOR EACH JOB, THERE'S A COST-CUTTING GOODYEAR TIRE!

GOODYEAR

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Sure-Grip, All-Weather—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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March 23, 1953

Foundation Equipment Corp.
Long Island City 1, N.Y.

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We most certainly find your pre-bid service on wellpoint dewatering jobs extremely beneficial to us in expediting the preparation of bids. These pre-bids save us a great deal of time, as well as money, and we would very much like to see your firm expand in this service.

Yours very truly,

Sam Spartin
Vice President

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Dewatering Systems
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CONTENTS ON PAGE 17

Waldo G. Bowman
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E. E. Halmos Jr. — *Managing Editor*
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V. T. Boughton — *Transportation, Power*
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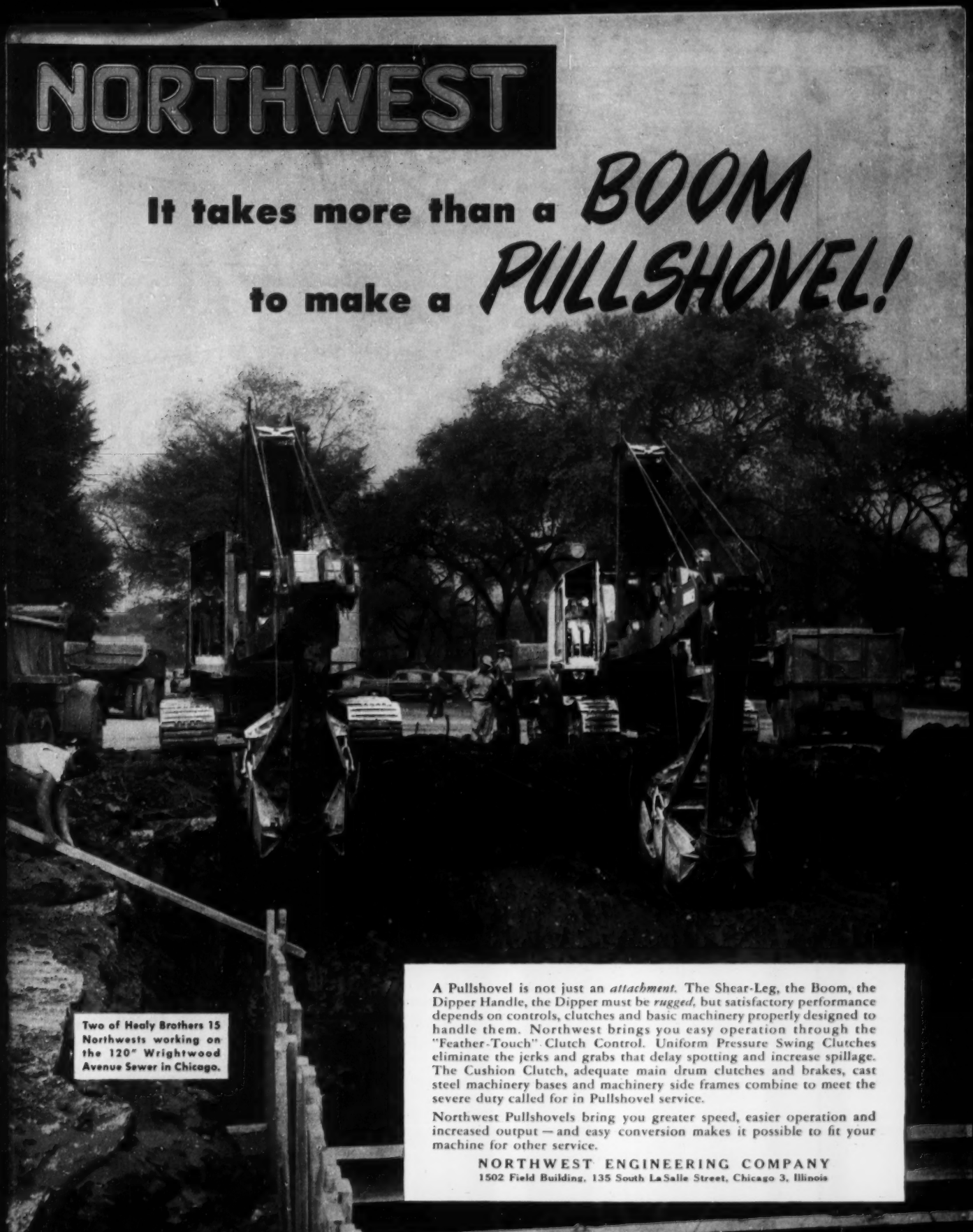
NORTHWEST

It takes more than a BOOM to make a PULLSHOVEL!



Two of Healy Brothers 15 Northwests working on the 120" Wrightwood Avenue Sewer in Chicago.

A Pullshovel is not just an *attachment.* The Shear-Leg, the Boom, the Dipper Handle, the Dipper must be *rugged,* but satisfactory performance depends on controls, clutches and basic machinery properly designed to handle them. Northwest brings you easy operation through the "Feather-Touch" Clutch Control. Uniform Pressure Swing Clutches eliminate the jerks and grabs that delay spotting and increase spillage. The Cushion Clutch, adequate main drum clutches and brakes, cast steel machinery bases and machinery side frames combine to meet the severe duty called for in Pullshovel service.

Northwest Pullshovels bring you greater speed, easier operation and increased output — and easy conversion makes it possible to fit your machine for other service.

NORTHWEST ENGINEERING COMPANY
1502 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

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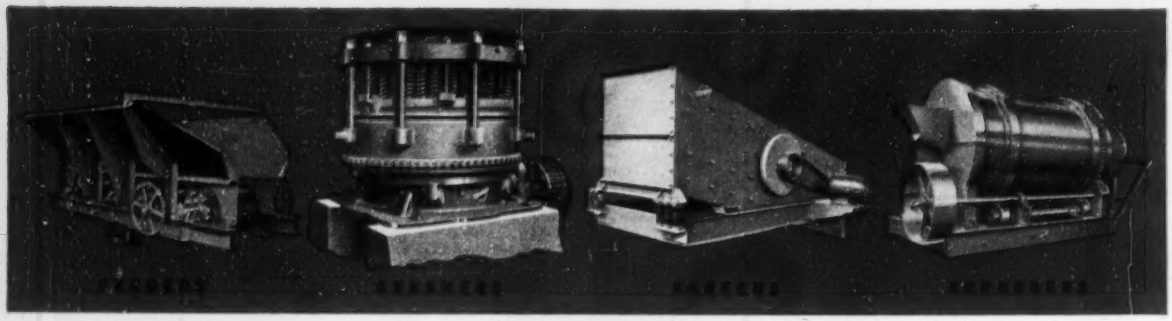


GET THIS CHECK-UP

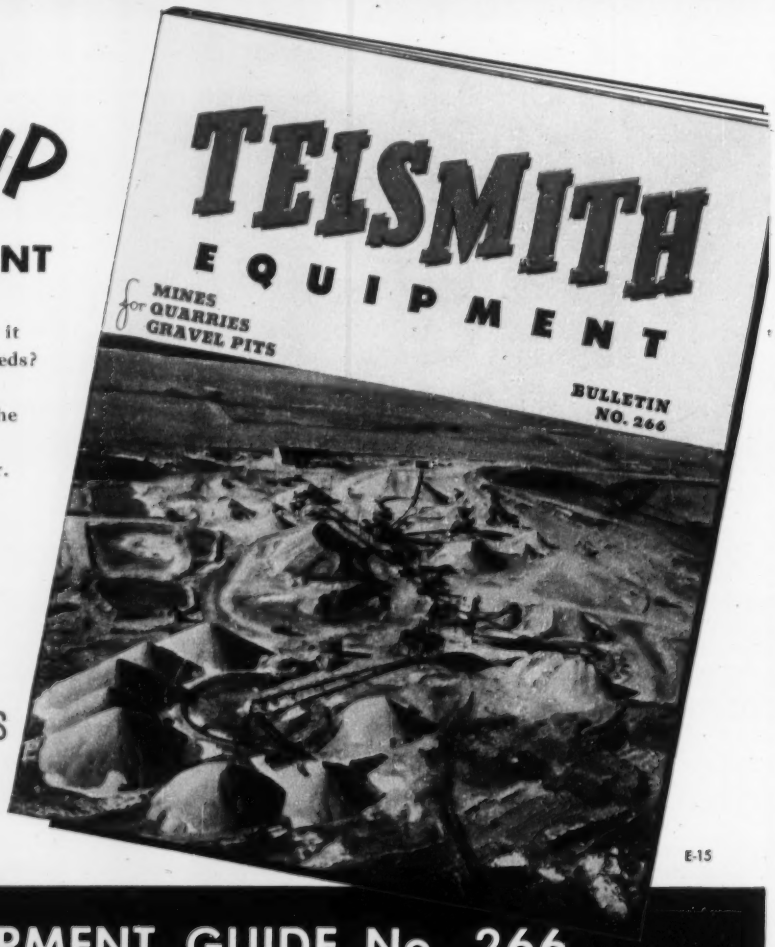
ON YOUR EQUIPMENT

Is your plant, and particularly its equipment so designed and built that it meets all your deposit and market needs? Is capacity high . . . and upkeep low? Does it pay the profits it should for the money you have invested? These are the *equipment facts* you're looking for. You'll find them in this guide. All the latest data on the newest equipment—Telsmith-engineered, modern, flexible, and the right type, model and size to turn out quality aggregate in quantity, at low cost.

●

Consult TELSMITH Engineers

let them relieve you of technical detail in plant planning and equipment selection.



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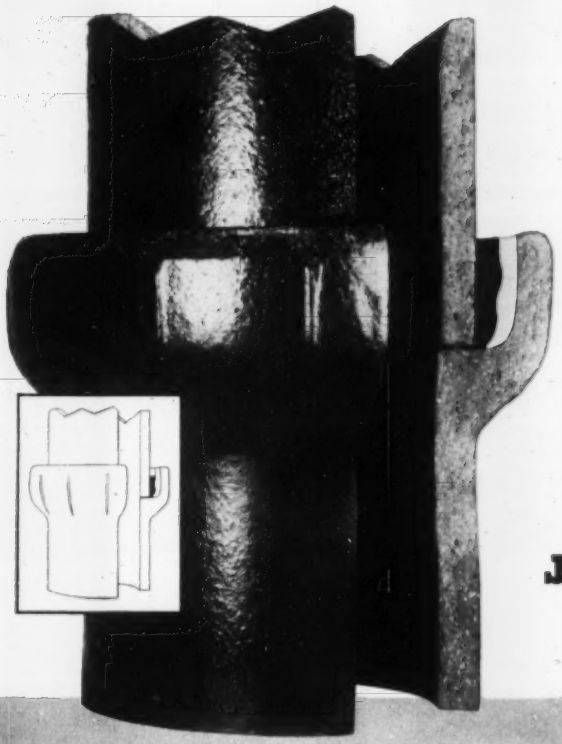
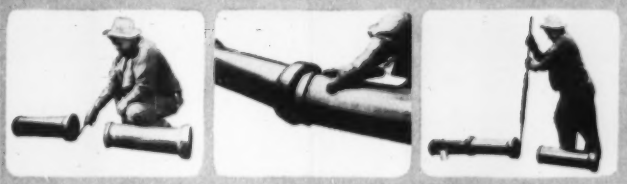


NOW!

THE FIRST TRULY MECHANICAL JOINTED CLAY PIPE FOR SEWER LINES

Amvit

JOINTED VITRIFIED CLAY PIPE



See how easily and quickly it is installed!

Grease joint with plain water

Line up bell and spigot

Push together and secure

- Root proof and infiltration proof.
- Install a 50-foot line in 15 minutes.
- Withstands hydrostatic pressures far exceeding any required.
- Flexible to compensate for pipe and trench irregularities.
- Easily opened for adding new laterals.
- Available on 4 through 8 inch clay pipe.

The Amvit Joint is a true mechanical joint. And it's low in cost. No special preparations are needed to lay the line. The joint is "built in" . . . delivered to you on the pipe ready to be put in the ditch and pushed together.

The Amvit Joint is a push type joint based on the ball and socket principle. The diameter of the plastic ring on the spigot is somewhat larger than the largest diameter of the plastic ring on the bell. When the two ends are pushed together, the rings are in constant compression, nothing can penetrate the joint.

The plastic material from which the Amvit Joint is made is not affected by any condition of underground service, alkalies and most sewage and industrial gases and acids.

For more information, write American Vitrified Products Company, National City Bank Building, Cleveland, Ohio.

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AMERICAN

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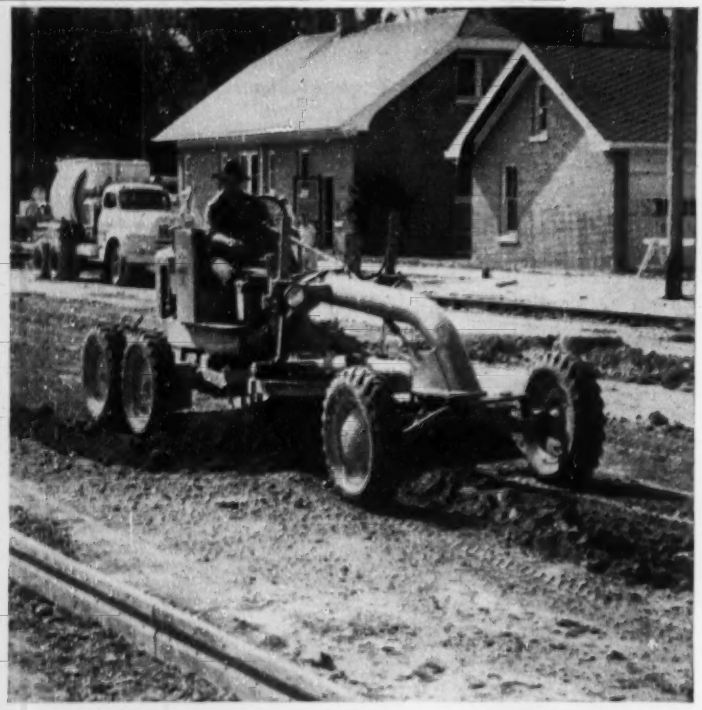
CLEVELAND, OHIO

Patent Pending

PLANTS ACROSS THE NATION . . . Brazil, Indiana • Cleveland, Ohio • Crawfordsville, Indiana • Detroit, Michigan • East Liverpool, Ohio Fenton, Michigan • Grand Ledge, Michigan • Lisbon, Ohio • Los Angeles, Calif. • Milwaukee, Wisconsin • South Bend, Indiana • Uhrichsville, Ohio

THOUSANDS OF ALLIS-CHALMERS MODEL D MOTOR GRADERS NOW IN USE



FINISHES BETWEEN FORMS, cleans up, loads trucks, backfills, landscapes . . . at low cost.

Five Years in the Field Prove Big-Grader Performance at One-Third the Cost

From its introduction in 1949, the Allis-Chalmers Model D established itself as a real pacemaker in the motor grader field. It was the first low-cost machine to offer tandem drive, single member tubular frame and the famous ROLL-AWAY moldboard. The "D" has proved again and again that it does outstanding work on both construction and maintenance.

Several easily mounted attachments make it invaluable all year 'round: hydraulically controlled, rear-end loader; shoulder maintainer that is interchangeable with loader bucket; hydraulically controlled scarifier; both blade and V-type snowplows.

Allis-Chalmers has now added even more to the Model D's workability. It offers a new 50 brake horsepower, "POWER-CRATER" engine; leaning front wheels** and power circle turn**. Yet the Model D's original cost is still only one-third that of a large grader, and operating, service and replacement part costs are proportionately low.

We invite you to talk with your nearby Allis-Chalmers dealer . . . compare values . . . and then ask for a demonstration.

**Optional equipment ROLL-AWAY and POWER-CRATER are Allis-Chalmers trademarks.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

(Advertisement)

LETTERS from contractors—

Sirs:

We purchased our first Model D in July, 1952. We are called on to do almost every kind of job known to the industry from paving small private driveways and parking areas to the larger street and road jobs. We also do a lot of paving inside buildings such as garages and warehouses. We find the Model D will deliver the goods in close places and on small jobs with a minimum amount of hand labor which is the difference between profit and loss on most small jobs.

The maneuverability, operator's vision, and mobility of the Model D make it a money-maker on any job, large or small. We find the Model D ideal for curb and gutter excavation, cutting sub grades, working intersections, laying down cold-mix materials, spreading base materials and finishing.

We purchased our second Model D in June, 1953, because our first machine had proved to be such a good investment. The Model D's do seventy percent of all our grader work, at our initial investment of about one-third that of the large machine. Our operating costs, fuel and repairs on the Model D's are less than one-third that of the large machine.

HUGH HANLEY
Norris-Hanley-Norris
General Contractors

Sirs:

On May 16, 1952, I took delivery on my Model D and in my opinion there is not a better machine built for small grading work. For spreading rock and dressing up shoulders, it is a dandy . . . you get up on the shoulder and dress it up without any break, and when you get through your work is done. No going back to repair rough places made by a heavier machine.

This grader hasn't been in the shop since it was purchased. I can grease it all over in five minutes. I belive it has made many times what it cost me.

L. E. BUHLER
L. F. Buhler Construction Co.

Sirs:

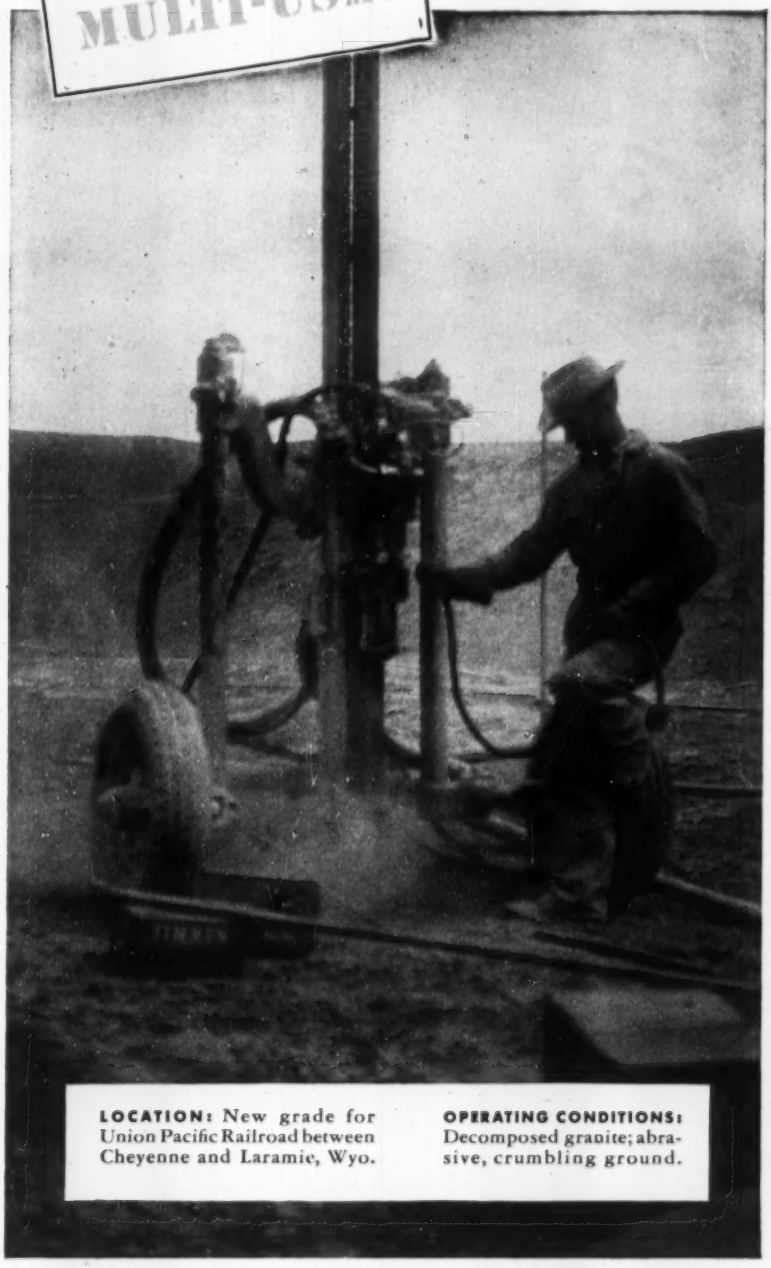
We are very pleased with our Allis-Chalmers Model D Motor Grader. This machine is being used to rough grade and finish grade streets and lots on our 75 acre development. Our area is exceptionally rocky, but we feel we have done big grader work with this machine. We believe this is the toughest machine for its size we have seen.

The "D" is outstanding in its ease of operation. Our operator says he has excellent visibility at all times. It is economical to operate and has worked very satisfactorily.

I. J. MAY, *President*
Southwest Development Co.

CARBIDE INSERT? or MULTI-USE?

Morrison-Knudsen made faster drilling time on this big railroad job with TIMKEN® carbide insert bits



LOCATION: New grade for Union Pacific Railroad between Cheyenne and Laramie, Wyo.

OPERATING CONDITIONS: Decomposed granite; abrasive, crumbling ground.

Morrison-Knudsen Company had a big project on the Union Pacific Railroad. They lowered the grade over Sherman Hill and completed about 38 miles of new grade in 12 months.

They tried various bits on this job and found that Timken® carbide insert bits gave them lowest cost per foot of hole drilled. They drilled decomposed granite—crumbling and abrasive. With Timken carbide insert bits they drilled faster and had fewer bit changes.

In hard and abrasive ground, you can always drill faster with Timken carbide insert bits. They're also most economical for constant-gage holes, small-diameter blast holes, or extremely deep holes.

But they're not *always* the most economical bit . . .

In ordinary ground, Timken multi-use bits are usually best. With correct and controlled reconditioning, they give lowest cost per foot of hole when you can drill full increments of steel.

All Timken bits, carbide insert and multi-use, are interchangeable in the same thread series. You can switch bits quickly and easily, right on the job.

To get the bits best suited to your drilling requirements, call on the Timken Rock Bit Engineering Service. Write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

...your best bet for the best bit ...for every job

TIMKEN

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PALMER Power Units are available in all standard voltages up to and including 2400 volts and can be furnished complete with any of the leading Diesel or Gasoline engines. See your *local* Industrial Engine Dealer for complete information. Dealers and distributors in principal cities of United States and Canada.

PALMER also manufactures: Synchronous Motors, 400 Cycle Generators and 3600 RPM Lightweight Generators.

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GENERAL OFFICES—ALLENTOWN, PENNA., U.S.A.
MANUFACTURERS OF THE "CEMENT GUN"

READER COMMENT

Bidding favored

SIR: If the engineering profession fears bidding for engineering services (ENR May 13, p. 40, and earlier comment), it appears that the profession is in need of house cleaning within its own ranks. When bids on a project are entered by several offices, each will have certain necessary requirements—such as registration, experience in that field, references, manpower, general facilities; and a degree of sales and presentation ability.

An office may have the first five but lack the sixth and thereby some of the overhead expense. Overhead generally runs about 50% of the direct costs. Thus a closely knit group of top engineers could propose a lower fee with less overhead water for the clients' expense. Such office efficiency should have an advantage.

Again, some engineers can attack a design and produce a solution much faster than others. Given the same problem for solution, hardly two engineers in ten will come up with the same solution. Thus, fees have more facets than the professional ethics of a fixed rate. Or should junior engineers likewise be paid a union rate, regardless of ability?

Mention was made that the contractor has an easier job bidding on a complete set of drawings and specifications than the architect or engineer has in bidding for those design contracts. An engineer making that statement indicates a lack of business acumen, which is probably a serious deficiency in the profession generally. When a contractor bids on a million dollar contract, he has to find and estimate upwards to $900,000 in direct job costs, then add his operating overhead and profit. The architect or engineer under average fees on the same job has about 6% of the million involved in his fee, with only half of that as his direct costs. He generally quotes a percentage of what the client wishes to spend or contract for. There is little comparison in the risks.

While it may be true that councilmen generally may be constrained to accept low bids, elimination of bidding for architectural or engineering services would not prevent the award to unqualified offices. There would be more awards to a favored few—those having an inside track, whether by virtue of ability or because of friendship, favors, or good lobbying.

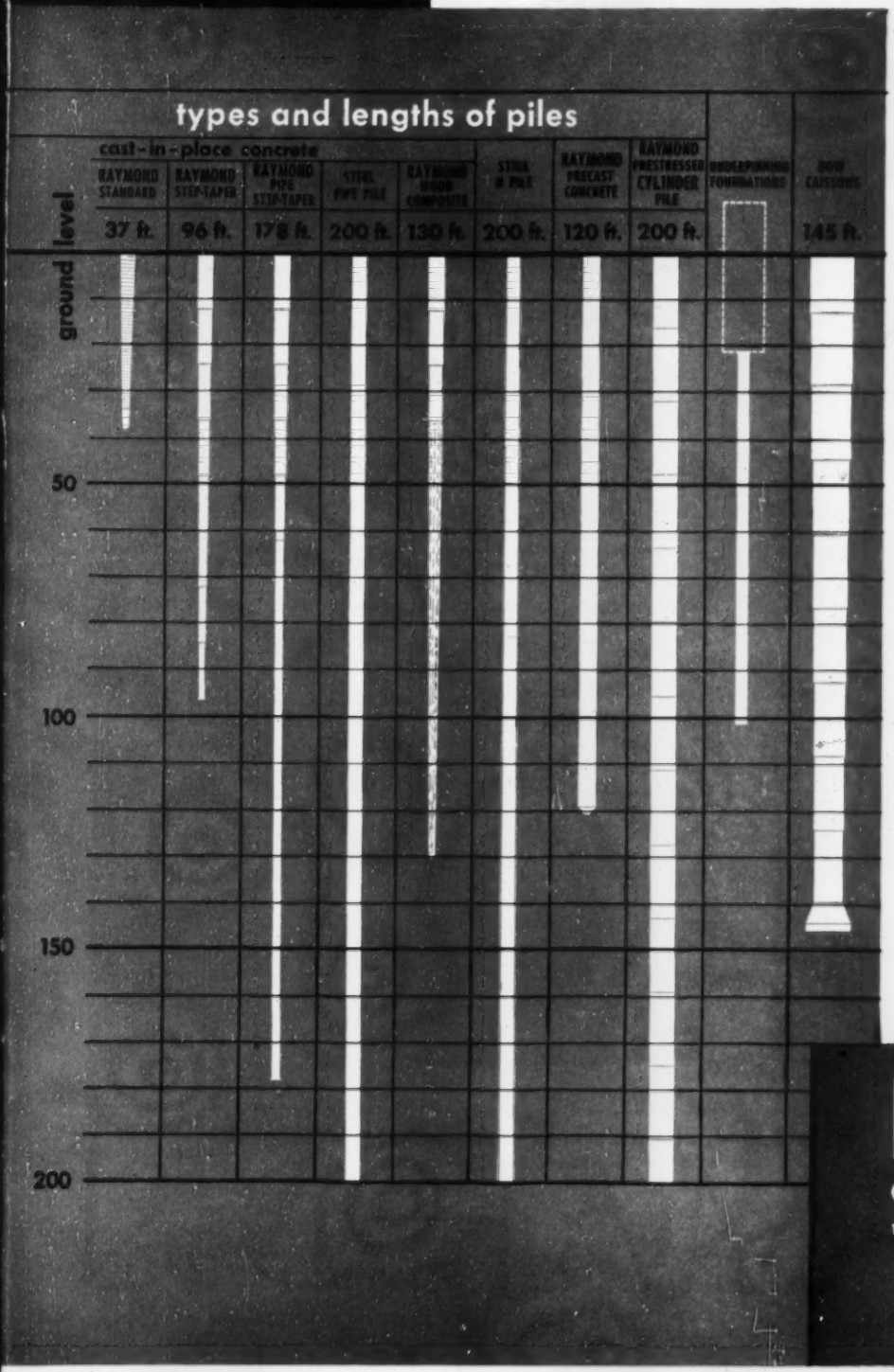
Pause to recall the recent growth of large engineering offices NOT headed

(*Continued on page 14*)

Raymond Features!

NUMBER TWO OF A SERIES

A Raymond PILE TO MEET EVERY NEED



WHETHER you are building a bridge, a skyscraper, a wharf or a dam, there's a Raymond Pile designed to fit your particular needs. For the past 56 years the Raymond Concrete Pile Company has been installing foundations around the world under a wide variety of soil conditions.

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Branch Offices in Principal Cities of the United States, Central and South America

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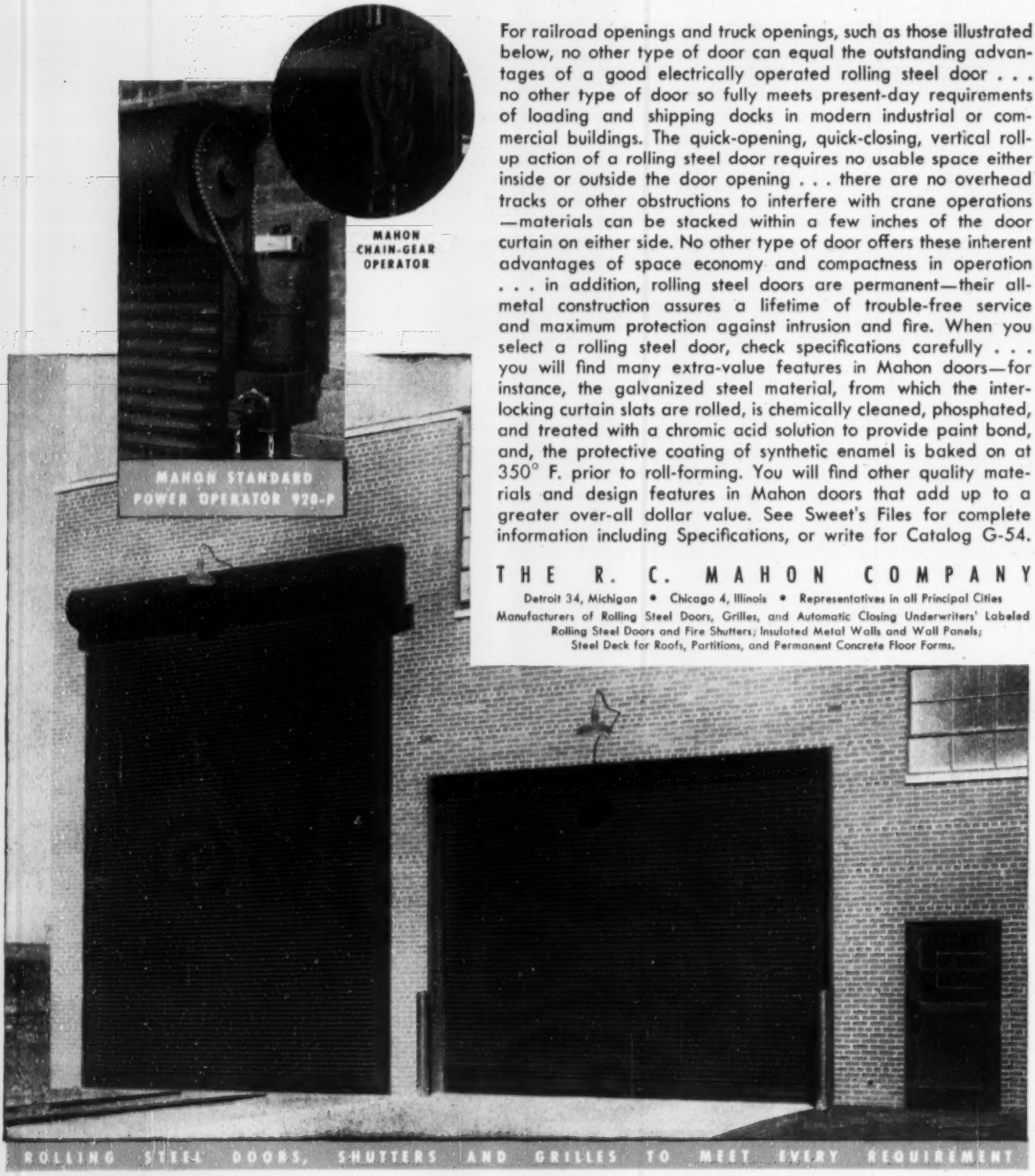
Manually, Mechanically, or Electrically Operated



For railroad openings and truck openings, such as those illustrated below, no other type of door can equal the outstanding advantages of a good electrically operated rolling steel door . . . no other type of door so fully meets present-day requirements of loading and shipping docks in modern industrial or commercial buildings. The quick-opening, quick-closing, vertical roll-up action of a rolling steel door requires no usable space either inside or outside the door opening . . . there are no overhead tracks or other obstructions to interfere with crane operations —materials can be stacked within a few inches of the door curtain on either side. No other type of door offers these inherent advantages of space economy and compactness in operation . . . in addition, rolling steel doors are permanent—their all-metal construction assures a lifetime of trouble-free service and maximum protection against intrusion and fire. When you select a rolling steel door, check specifications carefully . . . you will find many extra-value features in Mahon doors—for instance, the galvanized steel material, from which the interlocking curtain slats are rolled, is chemically cleaned, phosphated, and treated with a chromic acid solution to provide paint bond, and, the protective coating of synthetic enamel is baked on at 350° F. prior to roll-forming. You will find other quality materials and design features in Mahon doors that add up to a greater over-all dollar value. See Sweet's Files for complete information including Specifications, or write for Catalog G-54.

THE R. C. MAHON COMPANY

Detroit 34, Michigan • Chicago 4, Illinois • Representatives in all Principal Cities

Manufacturers of Rolling Steel Doors, Grilles, and Automatic Closing Underwriters' Labeled Rolling Steel Doors and Fire Shutters; Insulated Metal Walls and Wall Panels; Steel Deck for Roofs, Partitions, and Permanent Concrete Floor Forms.

ROLLING STEEL DOORS, SHUTTERS AND GRILLES TO MEET EVERY REQUIREMENT

Two of six Mahon Power Operated Rolling Steel Doors installed in a new plant for General Sheet Steel Corp., Detroit, Michigan. The Austin Company, Builders.

MAHON

Garden State Road Materials, Inc.

"HAVEN'T BURNED A BEARING SINCE USING C-800," says "Doc" Dougherty. "We have saved a lot of money on engine life with C-800."

FEEDING ROAD OIL TO "SPREADER": In addition to C-800 motor oil, Garden State uses only Cities Service road oil.

"HIGHLY RECOMMEND CITIES SERVICE TO ANY FLEET OPERATOR," says Dougherty, after 30 years' maintenance experience with buses, trucks and construction equipment.

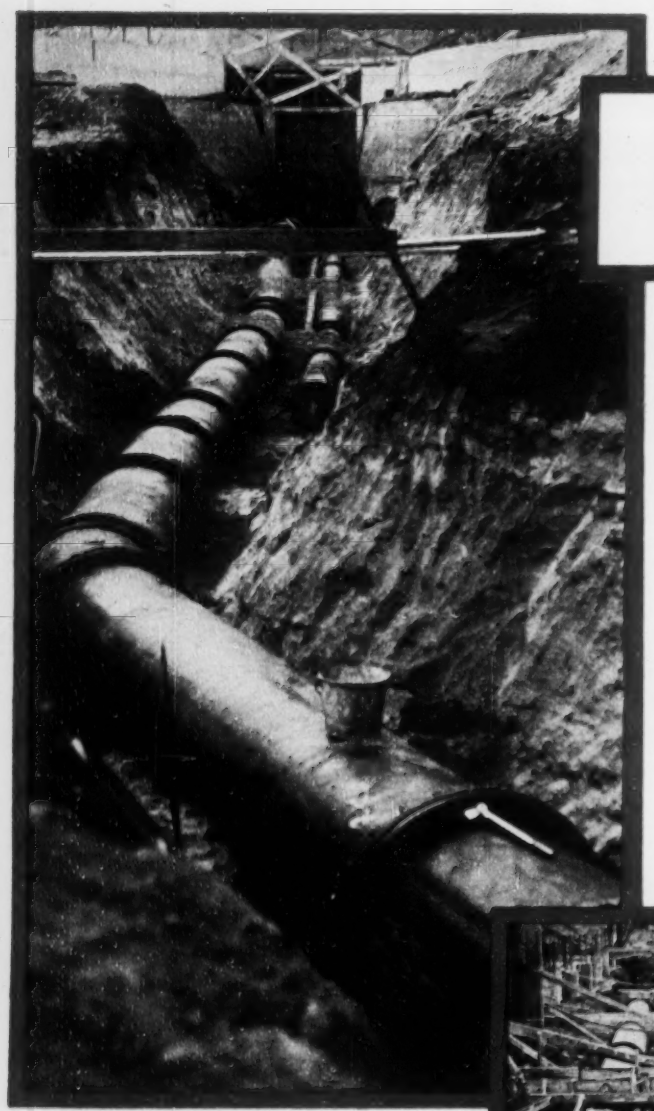
ANOTHER ROAD NEARS COMPLETION

Pictured above is a "spreader"—one of the 25 pieces of heavy road equipment constantly in use for the Garden State Road Materials, Inc., Cedar Grove, New Jersey. Although these trucks operate throughout four states, often under the severest conditions, William "Doc" Dougherty, president of the firm, reports that since using C-800 motor oil—"The rings do not stick, there is no sludge or varnish and we use less oil. C-800 motor oil is the best I have ever used."

Learn how you can increase the performance of *your* trucks with C-800 heavy duty motor oil. For details, contact your nearest Cities Service Office or write Cities Service Oil Company, Sixty Wall Tower, New York City 5, New York.

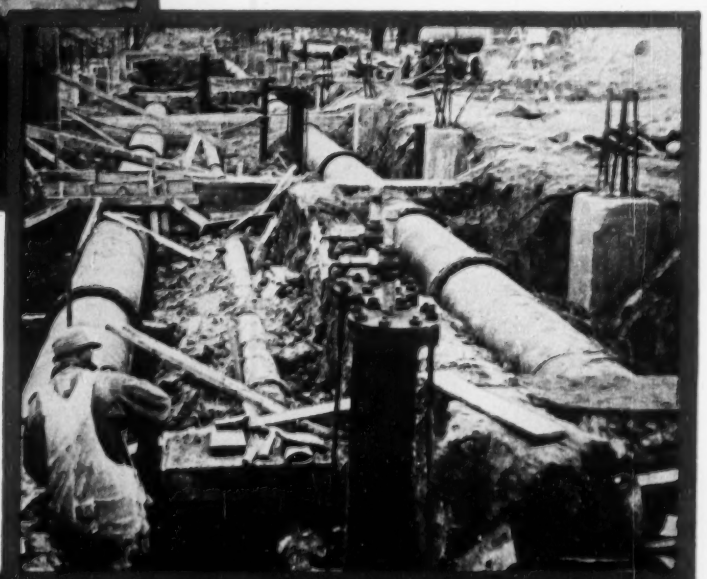
CITIES SERVICE

QUALITY PETROLEUM PRODUCTS



Used on jobs

When an installation, once completed, should be as trouble-proof as planning and materials can make it—engineers rely on cast iron pipe. It has high beam-strength, compressive-strength and shock-strength. Its effective resistance to corrosion ensures long life, underground or underwater. These are reasons why cast iron pipe is so widely used for water lines in tough terrain, pressure and outfall sewers, river crossings, and encased piping in sewage treatment and water filtration plants. For further information write: Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Ave., Chicago 3, Ill.



(above)
Cast iron mechanical joint pipe installed in connection with a new, larger sewage treatment plant at Rochester, Minn.

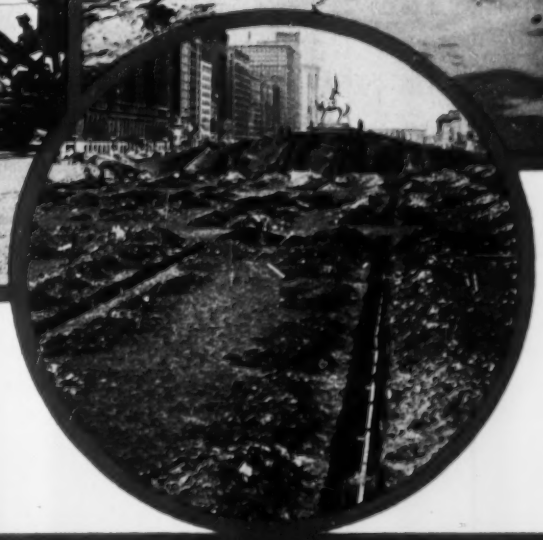
(at right)
Installing cast iron mechanical joint pipe used in air-conditioning system for Northland Shopping Center, Detroit, Mich.

CAST IRON PIPE

where long life is a "must"

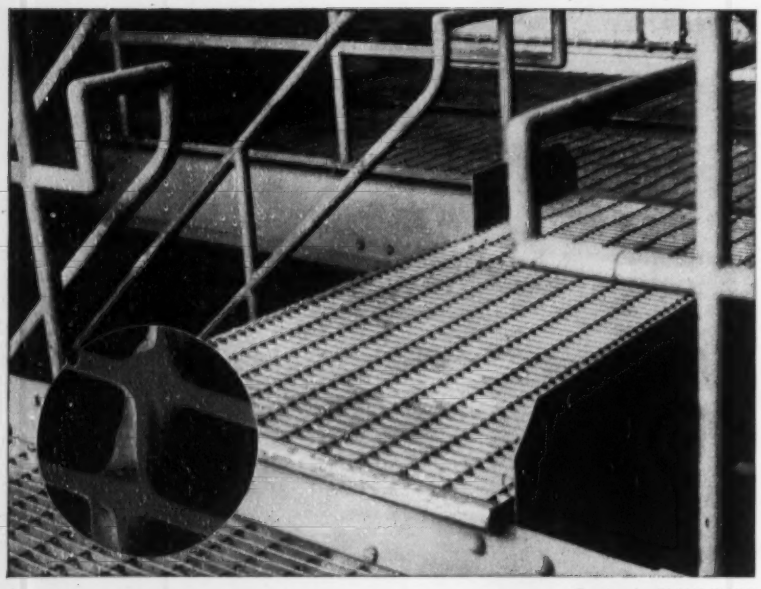
(top right)
Installing large diameter cast iron pipe across Willamette River at Portland, Oregon for sewer line to interceptors and to new disposal plant.

(below)
Seven miles of 16-inch mechanical joint cast iron pipe installed for gas main in New Jersey.



(at right)
Installation of cast iron pipe for irrigation and sprinkling system for a Chicago park.

SERVES FOR CENTURIES...



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where do **you** need **steel grating?**

There must be lots of places where you are now using grating—floors, platforms, walkways, catwalks and stair treads, for example.

But how about other uses—such as some sturdy shelving or a fan guard—or for covering a dangerous open pit or a light well. Take a good look around your plant and you'll probably come up with several jobs, including perhaps a new use, as steel grating is adaptable to many applications.

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Only BLAW-KNOX Electroforged® Steel Grating and Stair Treads —have these five exclusive features:

1. **rigid one-piece construction—easy to install**
2. **all surfaces accessible—easy to paint**
3. **no sharp corners to clog—self-cleaning**
4. **maximum open area—for light and ventilation**
5. **non-slip twisted crossbar—safe footing**

A short note will bring you a copy of new Bulletin No. 2365-R —a dimensional sketch will bring you a quotation.

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GRATING DEPARTMENT

GRATING APPLICATIONS: floors • platforms • walkways • catwalks • stair treads • fan guards • shelving • and many other uses, both outdoors and indoors, for versatile steel grating.

READER COMMENT

by engineers but by good promoters after top fees, with "junior member" engineers generally responsible for the clients' requirements.

The procedure of bidding is logical, with a general presentation by each of the interested firms. The general requirements for the professional services for each project could be forwarded to the clients by the local architectural or engineering society before the bid closing date.

It is illogical to compare these professional services with medical practices, on a fee basis.

HAROLD BROOCK
Bloomfield Hills, Mich.

CALENDAR

National Society of Professional Engineers, Schroeder Hotel, Milwaukee, Wis., June 9-12.

National Association of County Officials, highway exposition, Omaha, Neb., June 9-12.

American Society for Testing Materials, 57th annual meeting, Sherman and Morrison Hotels, Chicago, Ill., June 13-18.

American Society for Engineering Education, University of Illinois, Urbana, June 14-18.

American Society of Civil Engineers convention, Chalfonte-Haddon Hall Hotel, Atlantic City, N. J., June 14-19.

American Institute of Architects convention, Statler Hotel, Boston, Mass., June 15-19.

Conference on Thin Concrete Shells, Massachusetts Institute of Technology, Cambridge, Mass., June 21-23.

Third International Water Supply Congress, London, England, June 20-23 (Secretary General, L. Miller, 34 Park Street, London W 1).

Pan American Congress on Roads, Caracas, Venezuela, July 11-21.

Inter-American Congress of Sanitary Engineering, Sao Paulo, Brazil, July 25-31.

Conference on new developments in engineering design, Virginia Polytechnic Institute, Blacksburg, Va., Aug. 4-6.

National Council of State Boards of Engineering Examiners, annual meeting, Hotel Saint Paul, St. Paul, Minn., Aug. 26-28.

American Water Works Assn., fall meeting, Montauk Manor, Montauk, N. Y., Sept. 9-10.

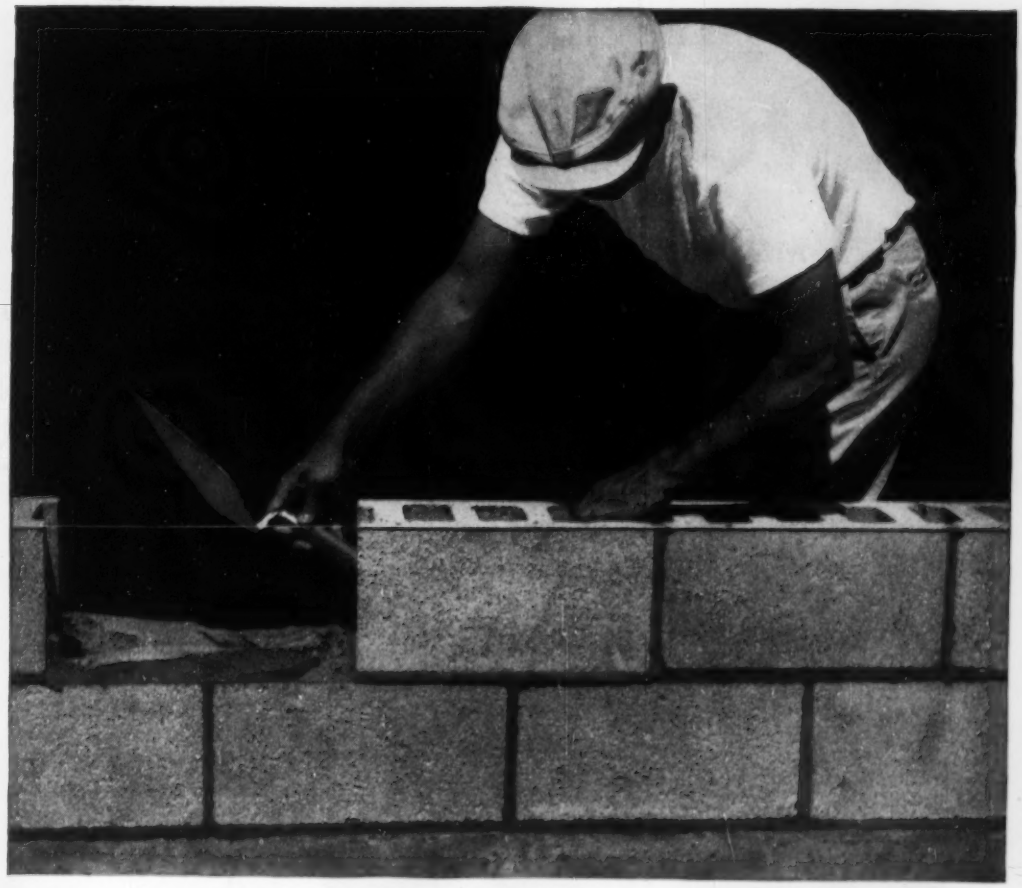
New England Water Works Assn., Dixville Notch, N. H., Sept. 13-15.

National Highway Conference of County Engineers and Officials, ARBA, Deshler-Hilton Hotel, Columbus, Ohio, Sept. 13-15.

Society for Experimental Stress Analysis and International Congress and Exposition: Bellvue-Stratford Hotel, Philadelphia, Pa., Sept. 21-23.

BRIXMENT

Better Mortar for Blocks



STAYS WORKABLE LONGER

To get a good bond between concrete blocks, the bricklayer must shift and adjust each block to its final position, before the mortar has stiffened.

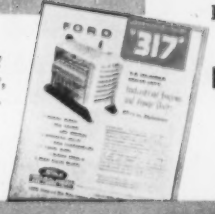
Brixment makes it easier for the bricklayer to do this. Brixment mortar stays plastic longer in the wall because it has high water-retaining capacity, which provides greater resistance to the suction of the block. This gives the bricklayer more time to adjust and shift the block to its final position, while the mortar is still plastic enough to form a good, tight bond.

NEW FORD "317" CU. IN. V-8 CYLINDER HEAVY DUTY ENGINE

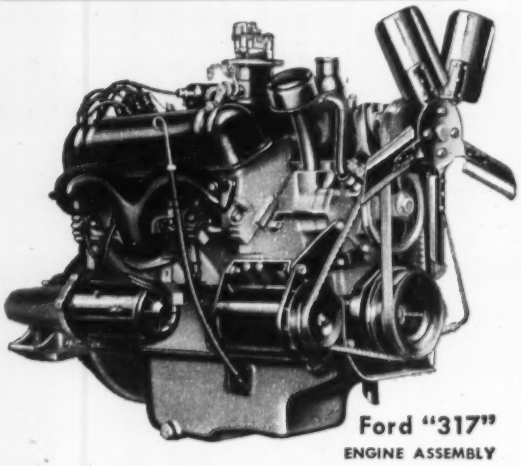
- ★ ULTRA-MODERN DESIGN
- ★ GAS-SAVING LOW FRICTION
- ★ OVERHEAD VALVE
- ★ HIGH COMPRESSION
- ★ LARGE BORE
- ★ SHORT STROKE
- ★ DEEP RIGID BLOCK

Designed especially for dependable, economical INDUSTRIAL SERVICE

This folder is available fully describing the new Ford "317" Industrial Engine, including detailed specifications, horsepower and torque curves, dimensional drawings, etc. Send for your copy now.



The Most Efficient Industrial Engine in its Class!



Ford "317" ENGINE ASSEMBLY

The new Ford "317" V-8 Industrial Engine offers *superior efficiency*, with completely modern features that equipment manufacturers, their designers and engineers will recognize as far ahead in the field of internal combustion gasoline engines:

- ★ **Short stroke, low-friction design to reduce internal friction and heat losses for *more usable power from less gas and with less engine wear!***
- ★ **Large bore permits greater diameter overhead intake and exhaust valves of free-turning design with integral guides, for higher breathing efficiency and longer valve life.**
- ★ **Compact, wedge-shaped combustion chambers for high turbulence, lower energy loss, more power from displacement size.**
- ★ **Built-in full-flow oil filtration for 100% protection of all bearings and prolonged engine life.**
- ★ **Outstanding structural rigidity with deep-skirt crankcase for 240° bearing support, wide-base flywheel housing connection and short, large diameter, fully-counterbalanced crankshaft for superior resistance to vibration.**

These and many other progressive design details result in an industrial engine that's tops in gas-saving power—developing high torque per cu. in.—compared with other make engines of this size.

Ford Sales Engineers are always glad to discuss your particular power problems and extend every possible help in solving them. You have merely to phone or write to—

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FORD MOTOR COMPANY
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INDUSTRIAL ENGINES AND POWER UNITS

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

Vol. 152, No. 22

NATIONAL AFFAIRS

U. S. Seaway preparations get priority action 21
Air Force bows to Congress on asphalt-concrete controversy 22
Chicago's $85-million filter plant job cleared by state supreme court ruling 23
River bed to be frozen to form cofferdam cut-off 23
Mississippi picks engineers for island causeway system 23
Georgia's biggest bridge nears completion 24
Kitimat's first alumina cargo is carried 5,700 miles by sea 24
120-mi pipeline to convey wet lime to cement plant 24
Integrated water systems, radioactivity spotlighted at biggest AWWA meeting 25
New York City pushes subway substitute as Jersey City "speedwalk" is dedicated 26
Panama Canal lets contract to remove slide menace on Contractor's Hill 27
Jobs in the news 27

LABOR

Order end of "strike against strike" 28
Canadians protest U. S. pipeline agreement 28
Needn't take non-union job for jobless pay, says court 28

FEATURES

Delaware Valley: Its river is the key to more construction 30
Adit fans aid tunnel ventilation 39
Telephone building made bomb-resistant 43

MUNICIPAL

Special problem—tailor-made dredge 51
Los Angeles to buy acreage for parks and public buildings 56
Highway-crossing problem is solved with corrugated metal tunnel 58
Study may speed Hudson River tube traffic 59

INTERNATIONAL

Investigation of Ontario Highway Department reveals road boom at root of trouble 63
Canadian National Railway will build 321-mi branch lines 64
Political issues may curb Kuwait's construction pace 64
Corbetta joins Rockefellers in low-cost housing project 66

MEN AND JOBS

India and U. S. to exchange 16 engineering educators 68

BUSINESS AND FINANCE

Contractors break all records in 1953 92
Total of contractor failures makes new postwar record 94
Activity this week 94

NEW PRODUCTS

Pneumatic grapple doubles speed of clamshell in mucking operations 109
Electronic pipe finder boasts rugged construction 110
Easy handling and economy claimed for tile adhesive 110
1.7-kw generator fits into car trunk, is low in cost 113
Low-cost power hoist has 500-lb lifting capacity 113
Revolving and swing door combination is "packaged" 114
Publications 116

Reader Comment 8
Calendar 14
Washington Observer 19
Obituaries 72
Legal 74
Construction Reports 80
Unit Prices 93
Editorials 120

THE CONSTRUCTION WEEK

WATER USE—Californians were moving fast—on two fronts—to solve some of their more pressing water problems.

A state-appointed Klamath River Commission, backed by a $25,000 appropriation, began organizing to work with an Oregon group to decide mutual problems related to the bi-state watershed of the Klamath River.

And seven of the state's organizations interested in water problems set up a committee to promote full development of California water resources as quickly as possible. C. W. Bradbury of Santa Barbara, representing the League of California Cities and County Supervisors Assn., is chairman of the new group.

LOTS OF AE JOBS—During the calendar years 1952 and 1953, the Corps of Engineers awarded about 1,600 contracts to 800 architect-engineer firms for design and inspection of military construction. The awards totaled about $70 million.

Emphasizing the ethical aspects of these awards, Corps sources said the contracts are negotiated, either on fixed-price, or cost-plus-fixed-fee bases, but not through advertising for competitive bids.

TAXABLE—Contractors will do well to watch the outcome of that test case in Burleigh County (Bismarck) N. D. district court, over application of state sales and use taxes to construction materials for public projects.

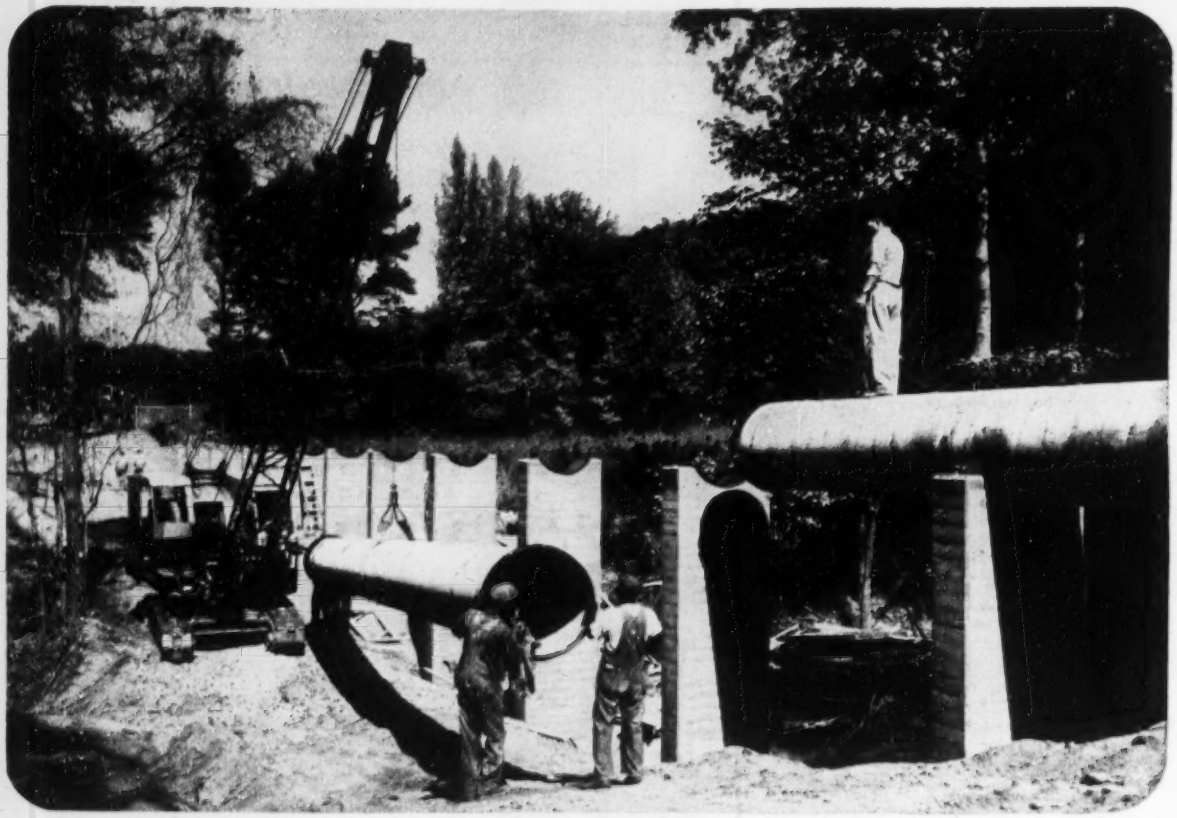
Suit was filed in behalf of the Northern Improvement Co., of Fargo, against the State Tax Commissioner.

Northern Improvement had asked the state for an $8,449 tax refund of money paid in sales and use taxes for material including cement, steel, iron, glass and paint, used in construction of projects for the federal government, the state, counties, cities, and school districts. The state refused the refund, holding that the money was collected under a law which states that the contractor is "the ultimate consumer."

SALARY CONTRIBUTIONS—Continuing its policy of upping pay scales in state college engineering jobs by supplementing state-paid salaries, the North Carolina Engineering Foundation has appropriated $37,381 for payment to state college engineering faculty members.

Since the foundation started its program in 1944—in an effort to attract and retain top-level men—contributions have totaled $548,980.

JOBS FROM STATES—A recent survey shows an increasing trend toward retention of consulting engineers by state and municipal industrial promotion groups. Seven states now have taken this step.



In Tuscaloosa, Alabama, this 50-foot length of Armco Welded Steel Pipe is being lifted onto concrete piers as part of a water line installation.

They Saved 130 Water Line Joints at Tuscaloosa

Rapidly expanding Tuscaloosa, Alabama, had to have additional facilities to provide for increased water consumption. Included in the project was a water line using 26,026 feet of Armco Welded Steel Pipe. By selecting Armco Pipe, they automatically gained the advantage of eliminating the time, labor, and cost of making 130 joints.

Here are the facts. Armco Welded Steel Pipe comes in 50-foot lengths, compared to usual pipe lengths of only 40 feet. With Armco Pipe, the job required just 520 joints. Forty-foot pipe would have required 130 extra joints.

In addition to the money-saving advantages of longer lengths, Armco Steel Pipe offers a wide choice of diameters (6 to 36 inches) and wall thicknesses ($\frac{9}{64}$- to $\frac{1}{2}$-inch). Also, Armco Pipe is supplied in exact lengths instead of the usual random or double-random lengths. A smooth, spun enamel lining prevents tuberculation and assures continued high flow capacity.

Write us for complete data on Armco Welded Steel Pipe. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 3774 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

ARMCO WELDED STEEL PIPE

WASHINGTON OBSERVER

Construction in all fields is holding and improving and makes the general economic picture brighter. This is the conclusion of the government survey of current business, which exhaustively covers all segments of business.

•

Expansion of commercial, institutional and recreational construction put in place is going hand-in-hand with house building and public utility building. The figures are glowing:

A 9% rise in new construction—called a bright spot by the Commerce Dept. economists. Private construction is up, and public activity is spurting, the accent being on highway building.

Industrial construction came out of a late 1953 decline and is advancing, particularly in utilities.

Housing is running at a million plus.

•

Federal financing of airport construction is re-endorsed in the Administration's aviation policy that the President has just signed. It comes along with the Commerce Dept.'s recent turnaround on asking funds from Congress to reconstitute the aid program.

The new policy is for concentration on vital national airports, as a link in air defense, rather than on local ports that were supposed to stimulate an interest in civil aviation. Traffic volume in local service has been disappointing, and of doubtful value as against cost. But at the same time urban air traffic has been burgeoning, so the new policy will direct more federal aid to the big ports.

Federal money will go for runways and navigational aids, rather than being aimed at terminals. Improvement of existing facilities will get priority over new projects.

Eisenhower says the policy statement will be his future guide.

•

St. Lawrence opponents now are jockeying to get representation on the newly voted authority, notwithstanding their last-ditch fight against the project. Buffalo, whose representatives long opposed the Seaway, has begun to get congressional backing to get one of its people on the authority board. Eisenhower will name the board, and will give both sectional and partisan consideration. An administrator probably will be named first, and the best bet is Lewis G. Castle, of Duluth, Minn., banker (see page 21).

•

Next move in the Hell's Canyon fight before the Federal Power Commission is up to the commission's own experts. They'll put the members on the spot with their recommendations—whether in favor of a federal high dam or for something on the order of Idaho Power Co.'s plan. The high dam lobby had its say in hearings just suspended, with former Reclamation Commissioner Strauss and former FPC Chairman Olds leading the fight. After the commission staff testifies, you may begin to get a reading on how FPC will rule on Idaho Power's application for a license to construct three dams. However, the fight will be in politics and the courts for a long time to come.

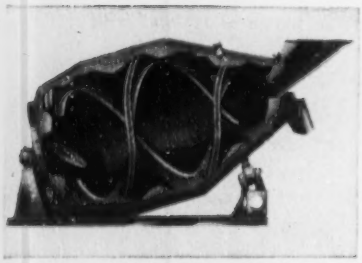
•

The Hoover Commission's task force on water resources will hold hearings in New York on June 14, and in Portland, Ore., on June 28. Adm. Ben Moreell, chairman of the group, will preside and most task force members will participate. Hearings in other parts of the country already have been held. The task force will write recommendations for the full commission to consider in its report, due next March.

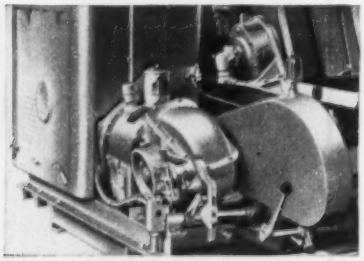
Millions of dollars worth of Jaeger 1954 models have been bought as a direct result of comparisons made at the Chicago show.

Jaeger is outselling short-lived truck mixers because

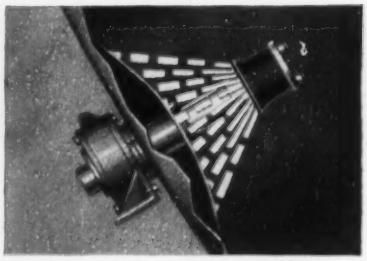
today's buyers buy for keeps



Compared with the paper-thin type of mixer, buyers prefer Jaeger's *8-gauge drum wrapper*, 5/16" head and bridge-truss blade feet, good for 8 to 10 years service.



In transmissions, they find nothing to compare with Jaeger's hydraulically actuated Super-Comatic, the perfected *finger-touch* one-lever transmission for truck mixers.



Buyers welcome Jaeger's water system that can jet 60 gallons a minute *through the head of the drum*. This faster water distribution means faster mixing and tempering.

Buyers equally approve this fast-charging and discharging open-end Maxi-Loader or Jaeger's long-proved sealed end loader.

No other unit offers anything to equal Jaeger's "To-the-spot" chute, extensible to 13 ft., for fast and accurate placement.

Add all these advantages to the *fastest* charging, mixing and discharging truck mixer on the market. That's the PLUS in Jaeger MIX-PLUS. Your Jaeger distributor will gladly supply complete facts to meet any payload problem. Ask him, or send for latest Catalog.

THE JAEGER MACHINE COMPANY

200 Dublin Avenue, Columbus 16, Ohio

LOADERS • AIR COMPRESSORS • PUMPS • MIXERS • PAVING MACHINES

U.S. Seaway preparations get priority action in Washington

Corporation appointments imminent, early court ruling seen on power issue—Great Lakes port cities step up planning

First moves toward organizing the newly authorized St. Lawrence Seaway Development Corp.—to cooperate with Canada in building the joint navigation project—were being worked on at the White House last weekend.

Two essential preliminaries appeared on the verge of decisive action. President Eisenhower was weighing the appointment of the man to head the corporation. Of names mentioned up to last weekend, Lewis C. Castle, president of the Northern Minnesota National Bank at Duluth, had the strongest support. Castle for many years an effective proponent of the Seaway, had strong senatorial and GOP endorsement.

For deputy administrator of the new corporation, there was general agreement among Seaway backers that the second in command should be an experienced engineer. Many project backers also contended that two or three engineers ought to be appointed to the corporation's five-man advisory board.

• **Quick power ruling seen**—While screening candidates for administrator, the White House also was drafting its official notification to the Canadian government that the United States now is authorized to join in construction of the Seaway. It was hoped that the note would be on its way to Canada this week.

With Canada notified and the corporation heads appointed, the new agency can begin consultations with the three other entities involved in the combination power and seaway development of the St. Lawrence. Washington observers last week expected the Supreme Court on June 1 or June 7—the last two days for handing down opinions in the present term—to reject the plea of the Lake Ontario Beach Owners for review of a lower court decision affirming the Federal Power Commission license to the New York State Power Authority. That action by the high court would remove the last remaining legal obstacle to construction of the joint project.

The New York Power Authority then could make a firm commitment for its portion of the power phase of the combination development. With that part definitely committed, the new U. S. Seaway Corporation could obtain similar commitments from the St. Lawrence Seaway Authority of Canada and from the Ontario Hydro-Electric Power Commission that they will go ahead concurrently with their portions of the project. As the Seaway depends upon creation of the pool behind the power dam, the navigation phase of the development cannot proceed without the power project.

• **Army Engineers await signal**—If the Supreme Court takes the prompt action expected, the arrangements for joint construction of the total project probably can be completed early this summer. The four entities then can get to work on financing and construction.

Apparently the President will wait until he appoints and confers with the head of the new corporation before he designates the Army Corps of Engineers to handle construction of the U. S. portion of the Seaway. Selection of the Army Engineers seems certain. It may be assumed that a staff is quietly being lined up to manage the job. Undoubtedly a field office will be opened on the New York side of the International Rapids section.

As these moves take place for construction of the St. Lawrence Seaway they will give an added push to plans for Great Lakes navigation improvements to take care of deep-draft shipping that will be traversing the new ocean link by 1959 or 1960.

Tentatively, about $100 million is planned for deepening Great Lakes connecting channels and $30 million for dredging improvements in the sixteen principal U. S. harbors (see table)—all this by the federal government. Concurrently, the local governments responsible for the harbors and the owners of abutting property are planning expenditures for port facilities far exceeding the harbor dredging estimates.

Further, the opening of deep-draft navigation from the Atlantic Ocean to the Great Lakes is expected to lead to an influx and expansion of industries that can profit from water transportation, and thus gives hopes for an eventual boom in industrial construction in this area.

None of the channel and harbor projects listed in the accompanying table has been authorized by Congress. The work listed would be in addition to projects already completed, now under way or at present authorized. There was about $63 million of work on connecting channels remaining to be completed at the beginning of fiscal year 1953 (July 1, 1952). Some of that work has been done since, but a large part remains to be accomplished.

Similarly, for the major harbors, a substantial amount of work remained

Dredging requirements

CHANNELS

Estimated cost of deepening Great Lakes connecting channels to 27 ft:

St. Mary's River	$43,270,000
Straits of Mackinac	1,275,000
St. Clair River	10,375,000
Lake St. Clair	3,340,000
Detroit River	41,324,000
Total	**$99,584,000**

HARBORS

Estimated cost to provide 27-ft depth in entrance channels and turning basins up to outer docks:

Harbor	Estimated cost
Duluth, Minn.	$93,000
Milwaukee, Wis.	510,000
Chicago, Ill.	1,433,000
Calumet Harbor, Ill.-Ind.	.....
Indiana Harbor, Ind.	805,000
Muskegon, Mich.	509,000
Detroit, Mich.	.....
Toledo, Ohio	5,736,000
Sandusky, Ohio	8,810,000
Lorain, Ohio	816,000
Cleveland, Ohio	1,174,000
Ashtabula, Ohio	652,000
Conneaut, Ohio	708,000
Erie, Pa.	5,018,000
Buffalo, N. Y.	1,862,000
Oswego, N. Y.	2,657,000
Total	**$30,793,000**

NOTE:—These estimates are based upon studies by the Corps of Engineers. They are not final or all-inclusive, since no detailed survey studies have yet been made.

to be done after July 1, 1952. Estimated cost of work still to be carried out under present programs at three harbors, for example, amounted on that date to about $18 million: Indiana Harbor, $967,000; Oswego, $11,494,000, and Calumet Harbor and River, $5,529,460 (required after fiscal 1953).

• **Cities set ambitious goals**—City officials, port commissions and shipping interests in virtually all Great Lakes port cities were in conference last week trying to decide what steps they should take toward launching harbor improvement programs. Here is a summary of the plans that were afoot in a few of the larger port cities:

• Chicago

Although Chicago has a 25.2-mi shoreline on Lake Michigan, it appears that major expansion of port facilities will take place six miles inland on the city's 1,800-acre Lake Calumet.

For one thing, public parks take up almost 70% of the lakefront. And, existing lakefront harbors offer very limited opportunities for expansion.

The Chicago Regional Port District, an agency created by the Illinois legislature in 1951, has developed a two-phase plan for Lake Calumet. First plan calls for expenditure of an estimated $20 million to provide 7,000 ft of dockage, transit sheds, and allied facilities. Second development stage, costing $50 million, would include creation of an anchorage basin, two miles long and 1,600 ft wide; 10½ miles of dockage with slips of 500-ft width.

The agency was empowered to issue bonds by the last session of the legislature. A State Supreme Court test of the validity of the financing power is due by September.

• Detroit

According to a Port of Detroit commission survey, the city will need additional docking facilities capable of handling seven to 12 oceangoing vessels. This would require docks costing an estimated $19 million or preferably slips costing $25 million.

The commission has proposed financing this construction in one of two ways: (1) by picking up its option to buy the American half of the Detroit-Windsor tunnel and using revenues to retire bonds over a 35-year period; or (2) by exercising its right to levy a tax on Wayne County residents to a maximum of $500,000 annually. So far, Wayne County officials have blocked both moves, and thus financing is up in the air.

Last week the Detroit city council heard a plan developed by William G. Koerber, retired businessman, and H. E. Beyster & Associates, Inc., an architect-engineer firm, which would create a 200-acre port facility on the Detroit River from Conner Creek to Lenox—costing about $5.3 million. The proposal has been referred to the city planning commission for study.

• Cleveland

The city council last week let a $40,000 contract to James C. Buckley, Inc., a New York firm, to make an economic and pre-engineering survey of the city's port needs. Newly appointed Port Director William J. Rogers has set these development goals:

1. A 15-mi extension of the present five-mile breakwater protecting Cleveland harbor.
2. Construction of a military-commercial airport on fill land between the shoreline and western extension of the breakwater.
3. Dredging of harbor channels, bulkheading of piers, and additional warehousing as necessary.

• Buffalo

Certain natural advantages plus a head start in planning put Buffalo—New York state's major Great Lakes port—in a favorable position for undertaking harbor and navigation improvements.

There are no immediate construction plans, but, the city has on hand a $50,000 survey made three years ago by Knappen, Tippetts, Abbott & McCarthy, New York consulting engineers, for a $23-million harbor improvement program.

The city is expected to seek legislation for a port authority with power to issue revenue bonds, which could be backed by proceeds from such municipal enterprises as parking garage and airport fees.

Buffalo has a half-mile of unused waterfront land highly favorable for harbor development, with a 23-ft depth and a mud bottom (it would be necessary to fill from shoreline to harbor line).

• Toledo

This Lake Erie port—tenth among U. S. ports last year in tonnage handled—has had a vested interest in the Seaway controversy for some time. And, following passage of the bill, the Toledo-Lucas County Port Commission lost no time in ordering an updating of previous port surveys made by Harland Batholomew & Associates of St. Louis.

Focal point of long-term development plans is the south shore of Maumee Bay, where it is hoped to construct a two-mile-long port facility. The project also would involve dredging a 400-ft channel.

Air Force bows to Congress on asphalt-concrete controversy

A House Armed Forces Subcommittee this week unanimously went on record against an Air Force directive giving concrete the benefit of a price differential in deciding whether to award airbase bids to asphalt or concrete. William E. Hess, chairman, said that the use of asphalt in "non-critical" areas of airfields would result in savings of "at least $50 million," based on projected programs of Air Force airbase construction.

The Air Force had no immediate official comment, but high officials indicated privately that the Air Force will have to go along with the committee's recommendation in future contracts. The Air Force obviously prefers concrete and would like to make a fight, but officials conceded they had "more important budget fights to make" than to take a stand on this one.

The committee formally put its recommendation as follows:

"It is our opinion, after considering all factors, that the continuation of concrete in critical areas as a design criteria is justified; and it is our opinion, from all the evidence, that cost in the non-critical areas between concrete and asphalt should be weighed without a price differential and by a direct comparison of first costs."

The controversy over asphalt vs concrete crystallized when the Air Force issued a directive on January 8 establishing a 5% differential to be applied in deciding bids for airstrip construction.

The Air Force took the position that asphalt had certain inherent disadvantages—that jet fuel and jet blast heat disintegrates asphalt pavement, that the debris from such disintegration gets into the airstream and damages the jet engine, and that maintenance costs are higher and operation dangers greater with asphalt.

All main parties to the dispute—the Asphalt Institute, the Portland Cement Assn., and the military services—agreed that concrete is to be preferred for particular areas: fueling locations, warmup aprons, places exposed to jet blast including ends of runways, and other "critical" areas.

Chicago's $85-million filter plant job cleared by state supreme court ruling

After losing the better part of one construction season because of legal obstructions, work is expected to be resumed soon on Chicago's Central District Filtration Plant just north of Navy Pier on Lake Michigan. When completed, the $85-million, 950-mgd plant will serve more than 3,000,000 people in the northern two-thirds of the Windy City and adjoining suburbs.

Last week the Illinois Supreme Court reversed a circuit court decision of last August, granting an injunction to stop construction (ENR Sept. 3, 1953, p. 23). At that time a $6.6-million contract for the construction of a huge sand, clay and rockfill cofferdam enclosing the 61-acre site, was nearly one-third finished, and the city had spent nearly $2.5 million for designs and cofferdam construction.

Notice to resume construction of the cofferdam will be given to the the contractor—Great Lakes Dredge and Dock Co.—as soon as certain legal points have been clarified. If there are no further legal delays—and the contractor can get his marine equipment in and start working within the next 30 days—the cofferdam should be completed and the 61-acre site dewatered by August '55, according to Public Works Commissioner Virgil E. Gunlock.

In the meantime, bids probably will be taken on six miles of large-diameter tunnels to connect the treatment plant with the city's existing intakes and distribution system. Low bids totaling nearly $15 million for this construction were received last fall, but contracts were not awarded because of the legal block.

In obtaining the injunction halting construction of the plant, a group of property owners in the vicinity claimed that the facilities would impair navigation. They also charged that the work would violate covenants made in 1891 to landowners along the lake shore relative to the extension of Lake Shore Drive and the park system.

The supreme court ruled that the plant would not be an interference to navigation and that the reclamation of the 61 acres of submerged land on which the plant will be built does not constitute a violation by the Chicago Park District of its 1891 covenants with the property owners.

The 1949 amended laws of Illinois permitting title to submerged land to be transferred to municipalities for the construction of water filtration plants were declared valid. And the fact that a permit to build the plant in Lake Michigan had been granted by the Army Engineers was considered proper authority to proceed with the work.

In granting the injunction stopping construction last fall, the circuit court ruled that Illinois had acted outside its authority in amending its laws relative to cities building such plants on submerged land. And the Army Engineer permit was considered valueless by the lower court.

River bed to be frozen to form cofferdam cut-off

By sinking refrigeration pipes into the bed of the Skagit River in Washington state, a frozen cut-off wall will be formed as part of a cofferdam to divert the river first to one side of the channel and then to the other. The project is a $17-million dam for the Seattle City Light Co.

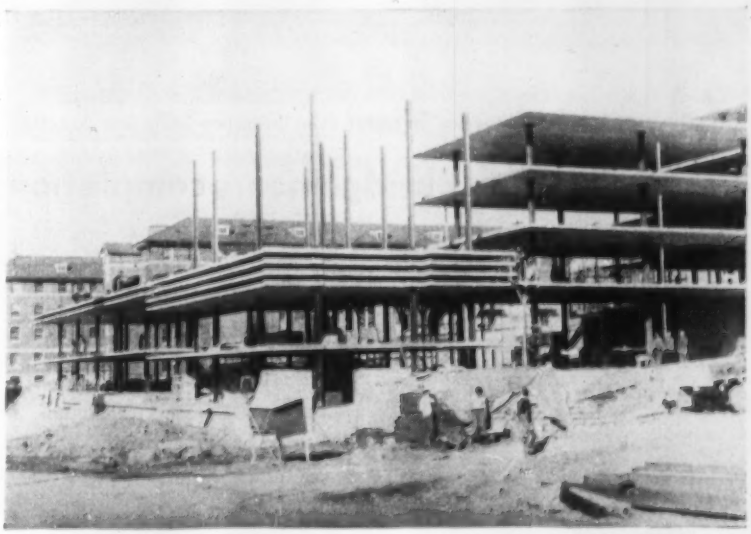
Freezing of the river bed to depths down to 150 ft is necessary because of the porous character of the stream bed up to and under the present Gorge diversion dam 500 ft upstream from the new dam site. If pumping were employed instead of freezing, the large amount of water removed might carry enough fine material to endanger the foundation of the upstream diversion dam.

The new dam will raise the head of the present Gorge power plant by about 100 ft, thereby increasing the plant capacity from 108,000 kw to an estimated 155,000-kw capacity without any change in equipment. J. L. Savage, Denver, Colo., is consulting engineer on the project, and bids will be called for the work this month.

Mississippi picks engineers for island causeway system

Mississippi's Harrison County Board of Supervisors has chosen Hazelet & Erdal, consulting engineers of Louisville, Ky., to make preliminary surveys of the projected $36-million causeway system linking Horn and Ship islands in the Gulf of Mexico with the mainland.

The 17 mi of causeway and a causeway bridge, linking the two islands, would serve to create a resort center of the two large barrier reefs.



Jacking up the jacking rate

Fastest lifting rate on a lift-slab project to date was registered in erecting a new dormitory for 2,000 students at Clemson College in South Carolina. A rate of 13 ft per hour was attained in lifting 8,000-sq ft slabs, whereas the customary rate on previous projects was three feet per hour.

The dormitory is a five-story building, the second of that height in the U. S. to be built by the lift-slab method. The first was an addition to the Mercy Hospital, Sacramento, Calif. (ENR May 13, 1954, p. 24). The structure contains 513,000 sq ft of floor and roof reinforced concrete slabs, which were raised in two operations. First, the slabs, formed at ground level, one above the other, were raised by jacks atop the building's steel columns to third-story level, where the first length of column terminated. Then, the top two-story length of columns was butt welded to the lower column sections, and the slabs were raised to their final positions. Vacuum was used to remove excess water from the slabs as soon as concrete was placed, enabling finishers to begin work in 30 minutes. Architects are Lyles, Bissett, Carlisle & Wolff, Columbia, S. C. The contractor is Daniel Construction Co., Greenville, S. C.

CANTILEVER TRUSS construction for central spans brings new bridge into final stage.

Georgia's biggest bridge nears completion

Steel erection enters its final stage on the $15-million Eugene Talmadge Memorial Bridge at Savannah, Ga., as crews begin to cantilever the 710-ft main span across the Savannah River on the South Carolina-Georgia state line. Principal structure in an 8.5-mi toll project, the cantilever bridge will be completed about July 20, with opening to traffic expected in mid-September—three months ahead of schedule.

With a 135-ft vertical clearance over the Savannah River channel, the main 710-ft span consists of two cantilevered trusses supporting a central truss section. Anchor spans for the main crossing cantilevers are made up of 279-ft trusses over the banks of the river.

Twenty-four girder spans ranging from 50 to 140 ft long make up the Georgia approach which runs through the west side of the city of Savannah. Girders in the South Carolina approach range from 80 to 140 ft in length, 26 of these spans crossing a swampy island.

Piers for the 6,034-ft bridge were completed in 5½ months last year, time being gained by placing concrete in unusually high lifts. Except where shafts were shorter, lifts were not under 50 ft. The highest continuous pour was 100 ft. Single piers support the approach spans of the new bridge, but the three central spans rest on twin piers.

Constructing piers below ground entailed some delays on the island under the South Carolina approach spans. The ground there is a mixture of clay, fine silt, sand, swamp mat and buried trees in various states of preservation. Piers are founded on timber piles, cut off below ground water level and capped with concrete. Wellpoints and electro-osmosis were tried for dewatering the pits excavated before piledriving, but the mixed nature of the soil was too much for the methods tried. Although the excavations were dried by the process, vibrations of piledriving caused the banks to slide in.

Solution of the foundation trouble was found in open pumping and skeletonized steel sheetpiling, which held the holes open and allowed satisfactory piledriving. The skeletonized sheeting arrangement consisted of rectangular bracing surrounded by individual sheetpiles with open spaces one to three feet wide between them.

Main piers in the river were built in the usual tremie-sealed cofferdams, and piers on the south approach presented little difficulty.

Merritt-Chapman and Scott, Inc., New York, is the over-all prime contractor for the project, and the American Bridge Co. is the contractor for the steel work.

North of the bridge the project continues to a junction with U. S. 17. Most of the first mile of this stretch is a concrete trestle across Back River; the remaining 6½ mi being highway on hard ground. Subcontractor for this trestle and road work, as well as five of the main bridge approach piers, is Duval Engineering and Contracting Co., of Jacksonville, Fla.

Tolls are expected to pay for the project by 1976. Design and construction management are handled by Parsons, Brinckerhoff, Hall and Macdonald, New York, for the Coastal Highway District of Georgia.

Kitimat's first alumina cargo is carried 5,700 miles by sea

The first cargo of alumina—refined bauxite—for Canada's giant Kitimat-Kemano project was due to arrive at Kitimat, B. C., late this week to establish a supply line for one of the most integrated aluminum operations in the world. The cargo left Port Esquival, Jamaica, May 16, carrying 11,000 tons of alumina refined from local ores.

Shipments to Kitimat from Jamaica will travel by way of the Panama Canal, sailing 5,700 mi to reach the smelter. The first stage of the giant Kitimat-Kemano hydroelectric project goes into operation this summer.

120-mi pipeline to carry wet lime to cement plant

Raw materials will be pipelined 120 mi from Clarkdale, Ariz., to Phoenix to be processed into portland cement, according to plans of the Halliburton Oil Well Cement Co., which bought a former mining property near Clarkdale as a site for a wet lime plant.

A 5-in. pipe will carry the wet lime by gravity along a right-of-way beside the north-south Black Canyon Highway.

Only one pump station will be required to move the mixture from the 3,500-ft level at Clarkdale to the 1,100-ft level at Phoenix.

Cost of moving the raw materials more than 120 mi by pipeline will be less than 5 cents a barrel as compared with the 50 cents a barrel required for shipping if the cement were manufactured at Clarkdale and transported to the Phoenix market by truck or rail.

Integrated water systems, radioactivity spotlighted at biggest AWWA meeting

Metropolitan-regional water systems, plastic pipe, and radioactive contamination of streams held the discussion spotlight last week for a record crowd of more than 2,000 at the 74th annual conference of the American Water Works Assn. in Seattle, Wash.

A major panel discussion on regional-metropolitan water supply led off with E. H. Campbell of the University of Washington as its first speaker, championing wider and more thorough integration.

Prof. Campbell decried piecemeal systems for supplying water (and other services) in metropolitan areas and called for more area-wide planning. He pointed out how better, more equitable distribution of water can be effected by annexation of fringe areas, by creation of metropolitan districts also by means of city-county consolidation, and by creation of "the federated metropolis." By this last scheme individual cities retain their desired autonomy while recognizing their interdependence in matters such as water supply. He cited the municipalities of metropolitan Toronto, 13 cities with a total population of 1,250,000, as a prime example just organized this past January. Baton Rouge, La., was cited as another example.

• **Radioactivity**—In what was one of the more significant papers on the program, radioactivity in water supply sources resulting from atomic energy activities was shown in the particular case discussed to be well within safe limits. The 10-year history of monitoring the Columbia River below the Hanford works was told in a paper by R. F. Foster and R. E. Rostenbach of Hanford Atomic Products Operation, General Electric Co., Richland, Wash. This radioactivity results from exposure of enormous but undisclosed quantities of cooling water to intense neutron flux as it passes through the nuclear reactors. No waste fission products are discharged to the river. But natural dissolved solids in the water absorb short half-life radioactivity of the beta gamma types.

Careful check on river conditions has been maintained through regular monitoring of water samples, fish and biological organisms taken from a 100-mile river length. From a maximum of 100%, the radioactivity reduces to 40% at Richland—23 miles downstream—down to 3% at McNary Dam—68 miles downstream. The Pasco water treatment plant—a standard rapid sand filter plant 32-miles down stream—reduces radioactivity to less than ¼ the level reached in the incoming water.

No quantitative amounts of water exposed or of radioactivity reached were given. But, in summary, Foster—who presented the paper—said that no health hazard currently exists. Radioactivity is well below 1/10th maximum permissible standards established by the Bureau of Standards. The data on the Columbia River and its long history of use for cooling atomic piles should be quite reassuring to communities using river waters below proposed nuclear power plants or other atomic energy installations.

• **Plastic pipe**—Walter D. Tiedeman, who directs the National Sanitation Foundation at the University of Michigan, gave a progress report on plastic pipe research into tastes, odors and toxicity:

No objectional substance has been extracted from the plastics by the water; rats with six months to go on an 18-month diet of water kept in contact with plastics are thriving. Four types of plastics most generally used for pipe are under test, and the water used is an aggressive water with a ph of 5.

It looks so far to Mr. Tiedeman that plastic pipe will be proclaimed completely suitable for water supply uses, from the standpoint of health.

Philip Britton, vice president of Carlon Products Co. in Cleveland, said a major problem before plastic pipe now is the task of establishing standards—without freezing standards too low. He cited the importance of long-term research toward this end at the Battelle Memorial Institute in Columbus, expressing his personal hope that all such efforts will be centralized and that the American Society for Testing Materials will set specifications for plastic pipe.

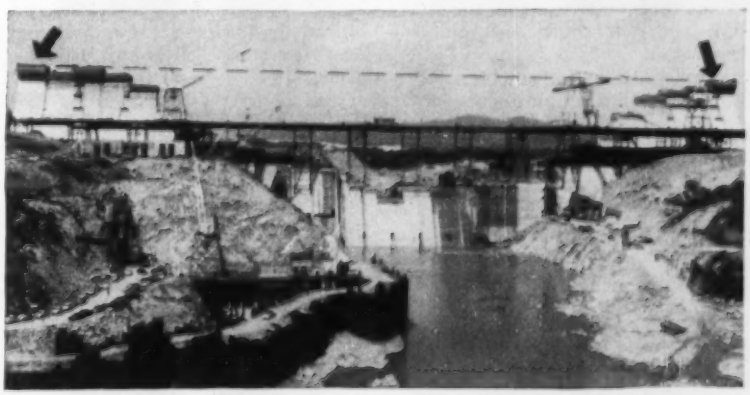
This session on plastic pipe was well attended, as was a similar session at last year's AWWA convention.

Dale L. Maffitt, general manager of Des Moines, Iowa, waterworks, (ENR May 20, p. 74) assumed presidency of AWWA at the convention's inaugural banquet. Frank C. Amsbury, Jr., Northern Illinois Water Corp., is the association's new vice president. Next year AWWA meets in Chicago.

Building problem aired

Urgent problems in building construction that research might solve were discussed at the third annual meeting of the Building Research Institute in Hershey, Pa., last week.

Speakers included Arthur A. Hood, editor, American Lumberman, who predicted a huge merchandising program for the building industry for 1954-55; H. C. Hardy, of Armour Research Foundation, Chicago, who pointed to the need for research in sound transmission in buildings; and John E. Haines, vice president, Minneapolis-Honeywell Regulator Co., who called for better air-conditioning design, based from the start on automatic controls.



Folsom Dam reaches a milestone

With Monoliths 1, 3 and 28 of the 1,400-ft-long Folsom Dam poured to their full height (arrows in photo) construction of the 350-ft-high project on the American River, Calif., has reached a major milestone.

Last 300,000 cu yd of concrete will be poured in another year. First bucket of concrete was poured in Block 28 less than two years ago. The 28 monoliths are each 50 ft wide, 270 ft thick at the base and 32 ft thick at the top. The $65-million Corps of Engineers project (ENR July 23, 1953, p. 39) is being built by Merritt-Chapman & Scott, New York, and the Savit Corp., Hartford, Conn.

New York City pushes subway substitute as Jersey City "speedwalk" is dedicated

The conveyor belt has now assumed its long-discussed role of serving as a passenger transportation medium.

On the heels of last week's dedication of the world's first passenger "speedwalk" by the Hudson & Manhattan Railroad Co. in Jersey City, N. J., Sidney A. Bingham, general manager and executive director of the New York City Transit Authority, announced that firm plans are being readied for an early start on the crosstown conveyor shuttle in midtown Manhattan.

Simultaneously, a proposal for a combined airline terminal, convention hall underground garage in San Francisco, featuring "moving sidewalk" connections, was made by Ben Swig, West Coast hotel man.

• **The Jersey "speedwalk"**—When William Reid, president of the Hudson & Manhattan, cut the ribbon on the passenger conveyor connecting his railroad's Erie station with the Erie Railroad's terminal in Jersey City, he ended 48 years of complaining by home-bound New Jersey commuters who were compelled to puff their way a long 10% slope to their trains.

The 227-ft, 30-ton conveyor (ENR Oct. 15, p. 23) was prefabricated at the Aurora, Ill., plant of Stepens-Adamson Manufacturing Co., which with the Goodyear Tire and Rubber Co., developed it and won the $75,000-contract for its erection.

The ⅝-in.-thick rubber and fabric belt is 460 ft. long and weighs 11,000 lbs. It is 56 in. wide, and is powered by a 20-hp electric motor that moves the belt at the rate of 120 fpm (1½ mph), about half walking speed.

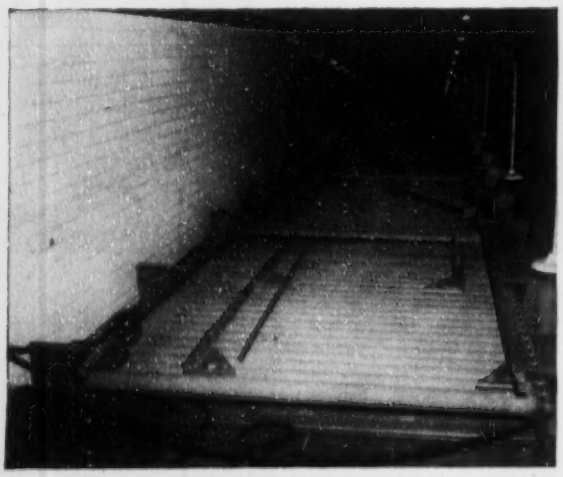
At each end of the walk, the belt passes over solid steel conveyor pulleys 70 in. long and 20 in. in diameter. The drive pulley is at the upper end of the walk with a similar driven pulley at the lower end. One additional pulley at each end is used for snubbing (taking up the slack) to keep proper tension in the belt. Pulleys and roller banks were manufactured by Dodge Manufacturing Co.

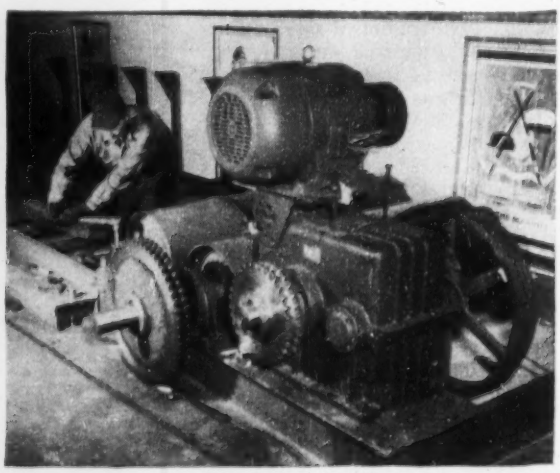
An unusual feature of the conveyor is that it is side-loading. Where ordinarily it is advisable for riders to walk straight on to a belt, a potential dewatering problem discouraged designers from excavating the floor of the existing tunnel. This necessitated fabrication of the power and pulley units above the floor of the tunnel at the head and foot ends of the conveyor with loading and unloading accomplished from the side.

Estimated capacity of the conveyor is 10,800 passengers per hour. William A. Davis, general superintendent of H & M, was in charge of installation.

• **Mass transportation vehicle**—Bingham expects an early contract award for the long-talked-about (ENR May 7, 1953, p. 47) crosstown conveyor shuttle linking New York's Grand Central Station with Times Square.

Designed to carry more than 18,000 passengers per hour with no waiting





ROLLER BANKS AND TWO-PULLEY POWER UNIT looked like this before belt, moving rails and aluminum skin were installed.

or platform jamming, the shuttle conveyor will be the result of many months of intensive experimentation during which working models have been studied by both Goodyear and Stevens-Adamson, its designers.

• **How does it work?**—From moving loading and unloading platforms, passengers will board small cars riding on rubber conveyor belts and rubber-tired banks of accelerator wheels. According to Bingham, the system is designed to provide two-way transportation at speed comparable with today's subway operation.

Passengers at either end of the system will walk directly onto a loading conveyor belt operating at a speed of one and one-half mph. Then, they will step into one of the 10-seat passenger cars riding on a parallel belt in a continuous chain operation (19 cars per min.) and at the same speed.

As the cars clear the end of the loading belt they will be speeded up over a bank of rubber-tired wheels onto the main conveyor belt that it is operating at 15 mph. At the far end of the main belt, the cars will be decelerated onto a slower belt that moves at the 1½-mph speed of the unloading belt. The cars then will make a U-turn around either end and continue in the opposite direction in the same manner.

It is the continuous operation that eliminates waiting periods, thus relieving rush-hour congestion.

The shuttle conveyor will use only the middle two-tracks site of the existing subway shuttle, leaving a trackway on either side of the conveyor system. These trackways will be transformed into arcades with shopping facilities.

Estimated cost for the equipment is $1.8 million or $700 per linear foot. This does not include cost of tunnel modification.

• **Weapon against decentralization**—The airline terminal, convention hall and underground garage for San Francisco have been accepted for study by the city's parking and transit council.

As visualized by Swig, the garage would be linked with the city's Union Square, heart of the shopping district, by a "moving sidewalk," and underground conveyor belt that would carry pedestrians into the congested district.

Freeways entering the city would have ramps leading directly into the garage, allowing "motorists to get to a parking space without meeting a single red light."

The building proposed by Swig would cover a city block two or three stories high, and would cost an estimated $12 million to $15 million.

Panama Canal lets contract to remove slide menace on Contractor's Hill

Contract for the removal of up to 25,000,000 cu yd of solid agglomerate rock from the face of Contractor's Hill to prevent a potential slide in the Gaillard Cut section of the Panama Canal (ENR May 6, p. 23) has been awarded to Tecon Corp., Dallas, Tex., on a low bid of $3,391,000, with 15 month allowed to complete the job.

Other than the Tecon Corp., bids were submitted by: Peter Kiewit, Omaha, Neb. (second low at $3,469,000); Morrison-Knudsen, Boise, Idaho; Western Contractors, Sioux City, Iowa; S. Healy Co., New York; Macco Pan-Pacific, Paramount, Calif., and J. A. Jones, Charlotte, N. C.

The background of the job is that in 1938 a crack was discovered atop Contractor's Hill and last year engineers found another, with more appearing this spring. A thorough examination—by digging a grid of trenches behind the original crack—indicated that there is a potential danger of the whole face of Contractor's Hill falling into the canal and preventing any movement of ship traffic until it is cleared. After a report by a board of consultants (ENR May 13, p. 25), Maj. Gen. John S. Seybold, Governor of the Canal Zone and head of the Panama Canal Co., requested the bids for removing the potential slide material.

Bids were submitted on a dual basis: a mobilization price (cost of assembling equipment, etc.), and a unit price for removing the first 1,000,000 cu yd, with increment increases in the unit price for each next 250,000 cu yd of rock and earth. As much as 2,500,000 cu yd may have to be removed, but the exact quantity can't be determined until excavation by blasting reveals the subsurface conditions. Debris will be hauled about 2,000 ft inland and dumped into an old reservoir known as Rio Grande.

According to A. Ray Smith, Tecon vice-president, his company already has begun mobilizing the necessary equipment. This means buying about $1,000,000 worth of new machines since the company heretofore has concentrated on highway paving and air-base work—Ramey Air Force Base, Puerto Rico, $6-million contract; Maguire Air Force Base, New Jersey, $7 million; Little Rock Air Force Base, Arkansas, $4.5 million; and Sedalia, Mo., Air Force Base, $9 million. Mr. Smith says negotiations so far have been completed to buy four 2½-yd Bucyrus-Erie diesel shovels and fifteen 25-ton Euclid hauling units.

"The job," says Mr. Smith, "is a challenging, delicate, even dangerous proposition. We'll have to move 8,500 cu yd of rock a day to meet the deadline of 15 months. We'll use about 1,000,000 lb of dynamite. Two cuts will be made, one on the north side of the hill, one on the south. Sections will be blasted off the back side, leaving 12-ft minimum buffer sections of rock and soil on the canal side. Then the buffer sections will be blasted away from the stream. This procedure will be followed till the hill has been reduced to the desired level.

The purpose is to cause immediate unloading of the hill to shift the center of gravity of the cracked portion away from the canal. The finished cut will leave benches approximately 40x40 ft to obtain a 1:1 finish slope."

The shooting plan and the scope of the operation are subject to change as the job progresses. Since the agglomerate rock is underlaid by Cucaracha shale, geologists have expressed concern that the removal of some 4,000,000 tons of rock may create an unbalanced condition that might also require correction.

The Tecon Corp. was formed nine years ago, and is a part of the industrial empire assembled by Clint W. Murchison, wealthy Dallas businessman. President of the firm is his son, C. W. Murchison, Jr. In addition to Vice-president Smith, another vice-president, Robert F. Thompson, will be concerned with the Panama work. About 50 of Tecon's engineering personnel will go to Panama and about 250 native laborers will be employed.

Jobs in the news

HOSPITAL—Contract for the construction of a station hospital at Fort Knox, Ky., has been awarded by the Corps of Engineers, Louisville, to George A. Fuller Co., New York, on low bid of $7,449,000.

BRIDGE FOUNDATIONS—Low bidder for construction of substructure of the new new Delaware River bridge to connect the Pennsylvania and New Jersey turnpikes was Merritt, Chapman & Scott, New York, at a bid of $3,688,223. Designed by George S. Richardson, consulting engineer, Pittsburgh, Pa., the bridge will have a three-span continuous arched-truss section over the shipping channel with center span of 682 ft, flanked by 341-ft spans. Overall length of te six-lane bridge will be 6,571 ft, incorporating almost a mile of approach girder spans.

Order end of 'strike against strike'

Bowing to the orders of national leaders, Philadelphia building tradesmen were back at their jobs last week, after a one-day "strike against a strike" (ENR May 20, p. 30).

The general strike had been sanctioned by the Philadelphia Building and Construction Trades Council as a protest against a prolonged jurisdictional wrangle between steamfitters and riggers over hoisting work.

The BTC action, however, apparently had succeeded in its objective—which was to force the steamfitters to submit their dispute to regular dispute machinery, rather than tie up millions of dollars worth of construction work in the city.

On orders from Richard J. Gray, president of the Building and Construction Trades Department of the American Federation of Labor, all trades (including the disputants) went back to work, and the dispute is to be submitted to the National Joint Board for Settlement of Jurisdictional Disputes—a building trades-supported impartial board.

• **Quiet week**—The end of the unusual action in Philadelphia was at the top of the news in a rather quiet week on labor dispute fronts.

Threats of trouble that were of general interest to the construction industry centered at three points: New Orleans, where the federal mediation service was called in for an effort to end a roofing employees strike; Buffalo, where an NLRB panel reserved decision on a charge that unions discriminated against four non-union workers; and Cincinnati, where the building trades council rejected a 10-cent-an-hour blanket raise offered by employers.

In New Orleans, the roofers finally accepted an employer offer of a total of 12½ cents an hour, with a similar raise effective May 1, 1955. In Buffalo, a contractor had charged that unions had implied that unless four non-union men joined locals, they would not supply skilled men.

On the credit side of the ledger, Curtis A. Nelson, Atomic Energy Commission manager at the Savannah River plant, congratulated construction workers for a full year of work without a single loss to labor-management disputes.

Civic subsidy

Members of Electrical Workers Union 46 at Seattle are assessing themselves a dollar every three months for a "jury duty fund" to pay regular wages to any member called on a jury. The local has 2,400 members; this will bring in about $800 a month.

The union took the stand that jury duty is a civic responsibility and that courts would gain more representative juries if more working men could serve on them.

Canadians protest U.S. pipeline agreement

A trade union contract signed in Washington to cover Canadian work on the $300-million Trans-Canada pipeline was attacked bitterly last week by Canadian labor leaders.

C. H. Millard, Canadian director of the United Steel Workers, called the contract—between the U. S. International Hod Carriers and Laborers' Union and two U. S. pipeline contractors—"an abridgement of the rights of Canadian workers."

Millard said that the contract, through an addendum, covered employment of Canadian laborers at $1 per hour—considerably less than comparable U. S. workers would receive.

Needn't take non-union job for jobless pay, says court

An unemployed union member shouldn't be required to seek a non-union job in order to qualify for unemployment compensation, a Michigan county circuit court said last week.

Judge Stephen J. Roth of Genesee County Circuit Court, held that the Michigan Employment Security Commission was wrong in denying compensation to James N. Spohn, Flint millwright, because he failed to apply for jobs said to be sub-standard, non-union jobs.

Spohn, according to testimony before the court and the commission in previous hearings, had been laid off his job, because of lack of work from his employer. The millwright, applying for unemployment compensation, testified that immediately he had contacted his union business agent and had looked for work on his own. Attorneys for Spohn's former employer, however, appeared before the commission to introduce advertisements in Flint newspapers seeking carpenters. A commission official, however, described these jobs as sub-standard and non-union.

Reversing the commission's decision not to pay compensation, Judge Roth commented: "as long as labor unions are lawful, it is my conviction that a claimant need not, as a prerequisite to availing himself of unemployment benefits, pursue a thoroughgoing . . . unionbusting course of conduct."

The Genesee court's action is in direct contradiction of a recent decision in Wayne county, where a court upheld a similar commission action.

Expensive policy fight

A federal circuit court of appeals has ordered a Denver construction labor union to pay two years' wages to a former member as a result of what the court says were unfair practices against him by the union.

The Carpet, Linoleum & Resilient Tile Layers Local 419, AFL, had carried the issue to court after the National Labor Relations Board ruled the union should reimburse William F. Coopersmith.

The court found that Coopersmith had been ejected forcibly from a union meeting and had been declared a member not in good standing as the result of a disagreement with the local's leadership over policy matters. The union subsequently interceded with Coopersmith's employer, Earl A. Dixon, Inc., to have him discharged.

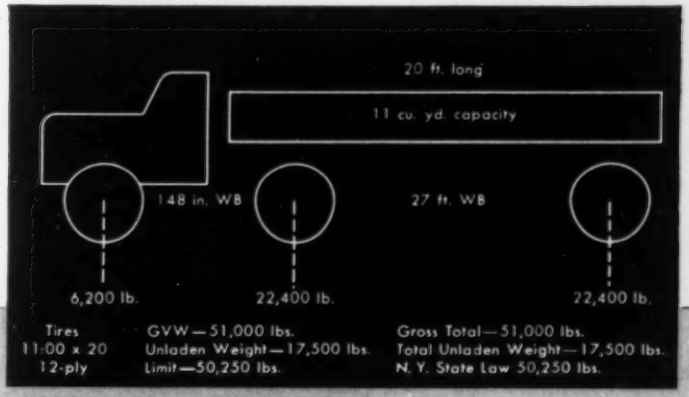
Random voting ended

When Californians go to the polls June 8 in a statewide election, workers for the first time in more than 50 years will not be able to leave their jobs at will to vote.

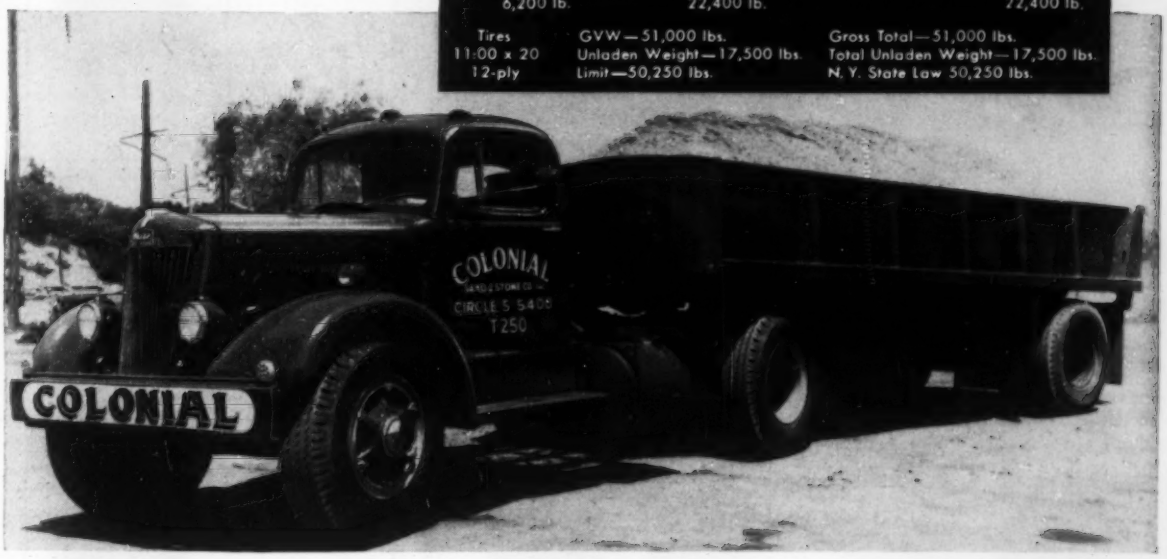
As a result of abuses in the time-off-for-voting privileges, the California Legislature has passed a bill, signed into law by the governor, placing restrictions on voters' rights.

The construction industry and airplane factories in the state had suffered particularly because of workers leaving jobs unattended on the pretense of going to vote and still collect their pay.

Under the new regulations, employers are required, 10 days before elections, to post a notice to workers regarding time off for voting. In turn workers must notify their employers two working days in advance if they will need time off for voting.



PAYLOAD diagram tells why Colonial's fleet of Whites pays off. Here is weight distribution on Model WC22PLT White with Marion Cable 11-yd. Dumper.



Colonial Sand & Stone Co., Inc., New York, tells how

FLEET OF WHITES

boosts payload ...reduces trip time

GET THE FACTS about the advantages of White Payload Design for your business—it pays off in extra payload, first day in service, and counts up to an amazing annual savings.

The diagram above shows how Colonial Sand & Stone Co., Inc., cuts down trip time, improves customer service because of the maneuverability and versatility of this unit and boosts payload.

Quality Whites carry bigger loads and have the rugged power and stamina to keep rolling up the trips and miles, day after day, regardless of load and terrain conditions.

See your White Representative for facts.

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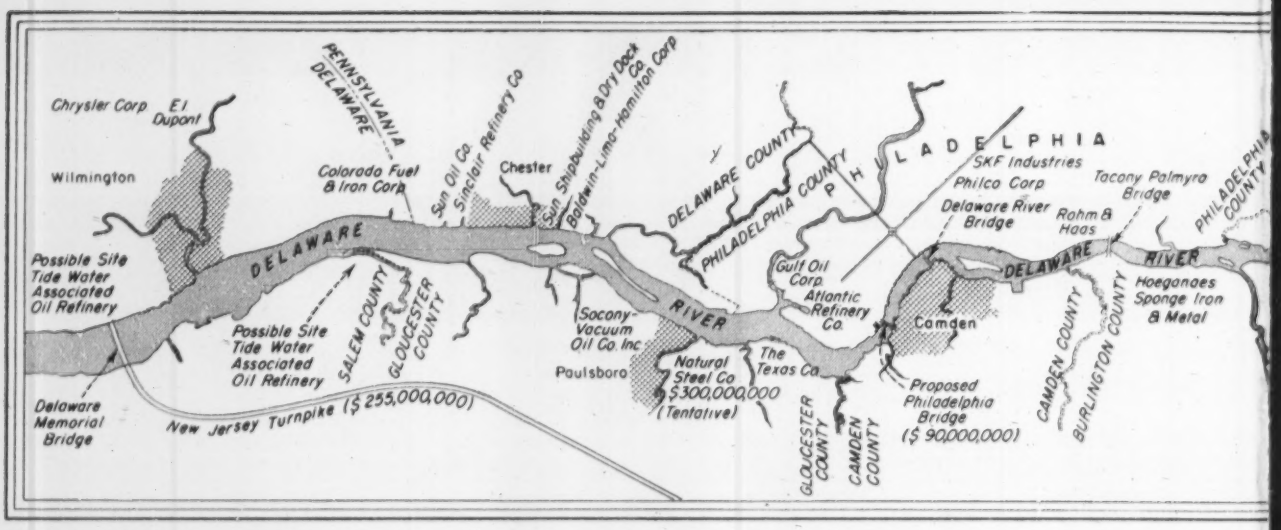


An ENR area survey:

Delaware Valley: its river is the key to more

J. P. Chamberlain
Associate Editor

Future business planning by an industry as mobile as construction must first of all depend upon singling out the areas that have important growth potentials. For over the long pull—through boom, normalcy, and depression—some regions are always better than others to consider as an area of profitable construction activity.

If these areas can be recognized early, so much the better for the construction man. Usually, however, the beginnings of a new growth pattern are not widely appreciated until some dramatic incident occurs to draw attention to what has been happening and to what the future promises.

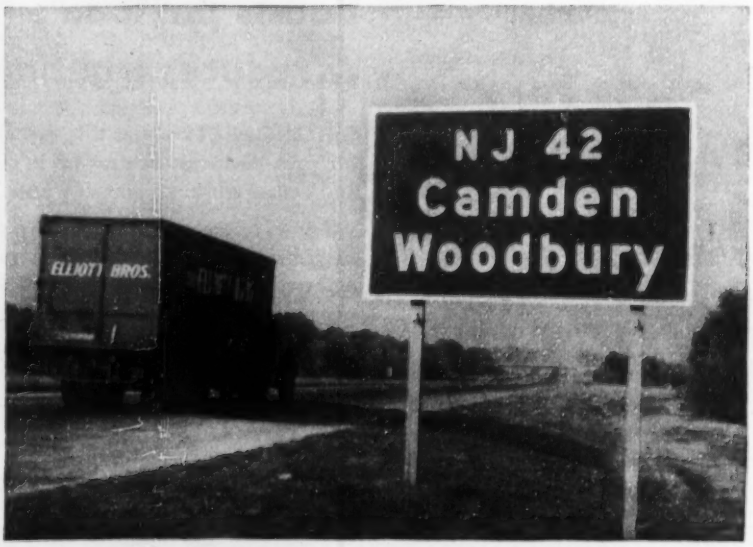
Such a dramatic incident was U. S. Steel Corp.'s decision in 1950 to build a big integrated plant in the Delaware River Valley, one of the oldest of the occupied regions in the U. S. What has been happening in the valley since then, along the Delaware River from Trenton to Philadelphia and downstream to Wilmington and below has surprised people who took it for granted that the valley had grown old and that the exciting things were happening somewhere else.

A change in the economics of the steel industry may bring more steel mills, and many more plants using steel, to the valley. This process will mean—as it already has in the case of the Fairless Works—more construction of all kinds.

But although steel has been in the foreground lately, if you check back over the valley's history you will find that for a generation a great deal of industrial expansion has been going ahead quietly. Since 1920, the west side of the river from Wilmington to Philadelphia has been filling up, particularly with chemical plants and oil refineries.

• **Big new refinery**—Right now, there is talk of another big refinery going to the valley. Tide Water Associated Oil Co. has obtained options on two big tracts of land—one near Delaware City about 15 mi south of Wilmington (map), the other at Pedricktown across the river in Salem County, N. J. Tide Water plans to build a $75-million refinery somewhere on the Atlantic seaboard. Although it refuses to confirm or deny that it will build at either of these sites along the Delaware, trade gossip is that one of these sites eventually will be chosen. Ocean-going tankers easily could bring their crude oil close to either site.

That is why many other refineries have located there over the last thirty years. And chemical plants have sprung up along the Delaware for similar reasons. Many of them are part of the great production complex of E. I. du Pont de Nemours & Co., Inc., placed there not just because the headquarters is in Wilmington but because raw materials can be brought together by water at a point close to the market for finished production.



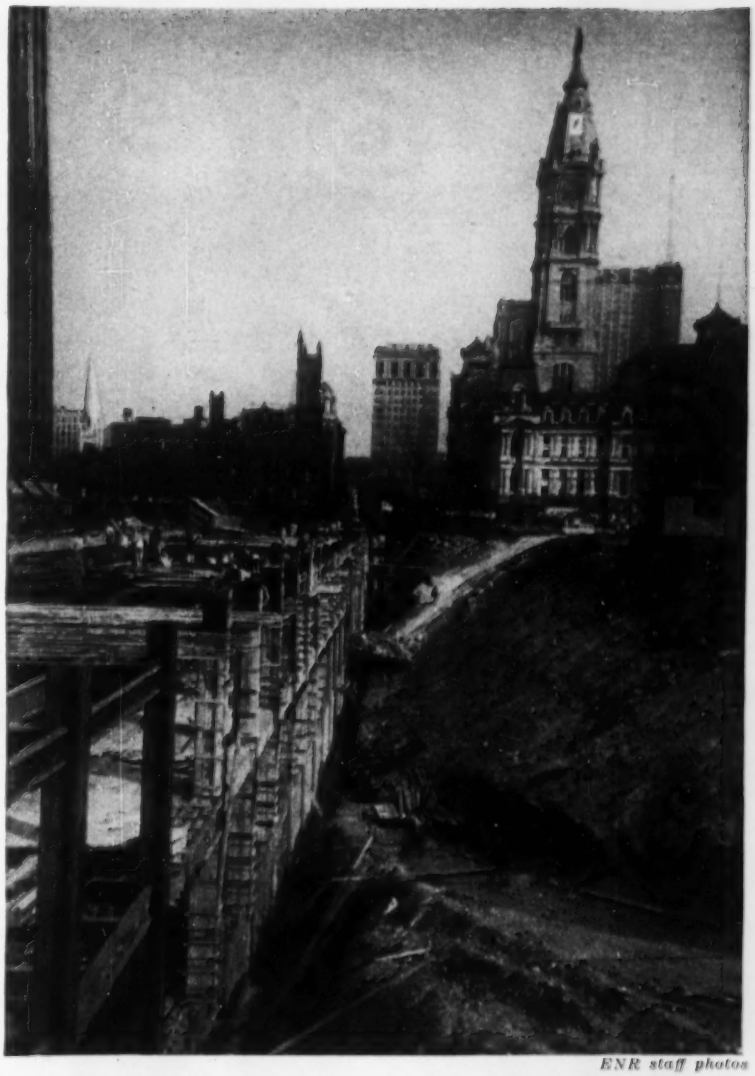
NEW JERSEY TURNPIKE—High-speed truck transport is doing much to put Delaware Valley products within a few hours of the huge New York market.

construction

This expansion has picked up speed in recent years. Between 1939 and 1947, manufacturing employment in the Greater Philadelphia-Delaware-South Jersey area increased 35%.

• **Expansion will continue**—And the expansion is continuing, in spite of business readjustment. Last September, manufacturers in the Philadelphia metropolitan area told the Federal Reserve Bank of Philadelphia they planned to spend $372 million on plant and equipment during the next 12 months. A spot check this March showed that 60% of the firms covered had made no changes in their plans.

(*Continued on page 32*)

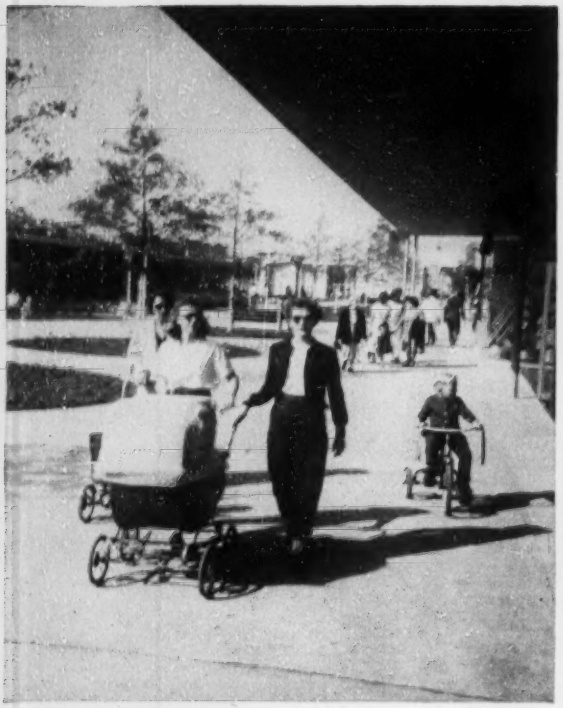


ENR staff photos

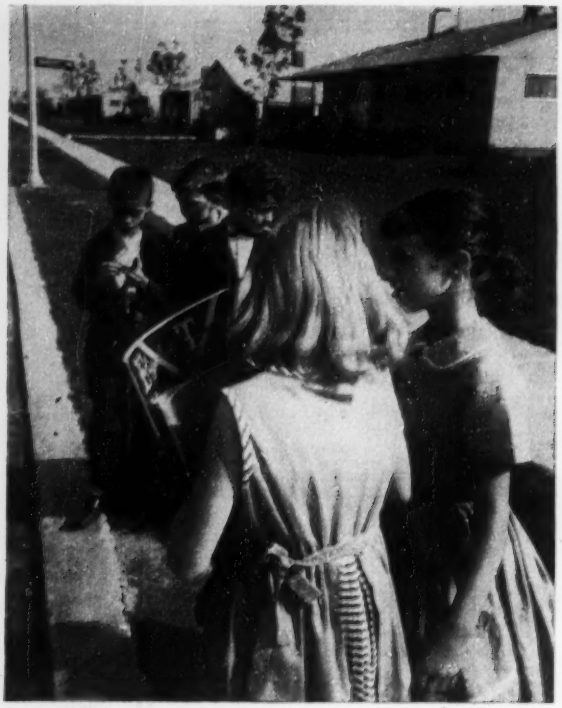
"CHINESE WALL"—Elevated railroad tracks of Pennsylvania R.R. to Philadelphia's Broad St. Station—comes down to make room for Penn Center.

ROAD, RAIL, AND WATER—this plant is close to all three types.

MORRISVILLE SUBURB—Fast inflow of workers and their families presents community problems which home builders can do much to work out.



LEVITTOWN SHOPPING CENTER—Indirectly, the Fairless Works is responsible for most construction in Morrisville area.



THE THREE R's—It takes a lot of taxes to educate children. One problem: most workers live outside township where plant is.

About 25% had boosted their capital spending programs in the last six months. Only 15% had decided to cut back.

Discount, if you like, some of the optimistic talk you'll get from the Chamber of Commerce of Greater Philadelphia, or from the Greater Philadelphia-Delaware-South Jersey Council. Of course, they are interested in attracting industry, and they paint things in rosy hues. But there are a number of big facts behind their optimism.

• North from the Atlantic to Philadelphia, the Delaware can carry large ocean-going vessels. Smaller ones can go as far as Trenton now—and big ones could do so if the channel between Philadelphia and Trenton were deepened to 40 ft.

• Besides being a seaway, the Delaware provides the huge amounts of water that are essential to some industrial processes.

• **The steel industry**—Maker of the most basic of all industrial materials, steel is reaching out for imported ores. It is now obvious to steelmen that the high-quality ores of the Mesabi will not last for many more years. That makes ores from South America, Labrador, and other parts of the world competitive, especially if these ores can reach the blast furnace by water, a cheaper method of transportation than rail.

The final approval by Congress of the St. Lawrence Seaway, after years of controversy, has taken some of the edge off the Delaware Valley's position as a steel center. When finished, the St. Lawrence Seaway could carry ore from Labrador to the inland steel mills that now get it from the Mesabi. Nevertheless, there is a solid economic basis for more steel development in the Delaware Valley. And here is why:

• **The end of the multiple basing-point system,** killed by a Supreme Court decision in 1948, has made it more difficult for steel producers to compete for northeastern markets without northeastern steel mills of their own.

At the time of the court decision, Bethlehem Steel was the only major producer with sizable production facilities on or near the Atlantic seaboard. Late in 1950, U. S. Steel Corp. electrified the Delaware Valley by its announcement that it planned a big integrated mill, to be put up near Morrisville, Pa., across the Delaware from Trenton.

Since then, National Steel Co. has bought land on the river below Camden, with tentative plans for a big plant of its own. And Colorado Fuel & Iron Corp., whose main plant is at Pueblo, Colo., has bought several smaller existing mills, one on the Delaware just above Wilmington, and the mills of John A. Roebling's Sons Co. in the Trenton area.

• **The fact that goes along with this: The end of the basing-point system also makes it good sense for companies that are heavy users of steel to locate near steel mills in order to save freight charges.**

Steel-using plants located near Delaware Valley steel mills would not be very far from the biggest market in the U.S. Within a 100-mi radius of Philadelphia live about 21 million people. Within a 300-mi radius is one-third of the U. S. population. This entire market can be reached quickly, either by truck along the New Jersey and Pennsylvania Turnpikes, by rail, or by water.

• **Steel users arrive**—Since it became known that more steel was going to be available in the Delaware Valley, steel users have been going to the region, though not as rapidly as some enthusiasts expected. Most of the newcomers have been quite small. But there have been some sizable expansions by companies already in the valley, such as SKF Industries at Philadelphia, and Kaiser Metal Products Co. at Bristol, Pa.

These expansions by companies now in the area point up the fact that steel users already in the valley can use all of the Fairless Works' present 1.8 mil-

(Continued on page 34)

1954 Award

OF THE CONCRETE REINFORCING STEEL INSTITUTE

presented to ARTHUR P. CLARK

...for his contribution to the advancement of reinforced concrete construction

Arthur P. Clark (left) receiving the 1954 Concrete Reinforcing Steel Institute Award from Earl J. Wheeler, Award Committee Chairman, at C.R.S.I. 30th Annual Meeting at the Boca Raton Hotel and Club, Boca Raton, Florida.

The 1954 Award of the Concrete Reinforcing Steel Institute was given to Mr. Arthur P. Clark, Research Associate for the American Iron and Steel Institute at the National Bureau of Standards, Washington, D. C. Mr. Clark is a graduate of the Michigan State Normal College and the University of Michigan with a Bachelor of Science Degree in Civil Engineering. He is a member of the American Society of Civil Engineers and has authored a number of technical papers which have been printed in the Journal of the American Concrete Institute, and is presently a member of the Board of Directors of that organization.

Mr. Clark received the Award for his contribution to the development of the A-305 type of reinforcing bar—the bar now recognized as the American standard for use in present day reinforced concrete construction.

The C.R.S.I. Award is administered by representatives appointed by the American Concrete Institute, Associated General Contractors of America, and American Society of Civil Engineers. The 1954 Award Committee consisted of: Chairman—Earl J. Wheeler, President, Frank Messer & Sons, Inc., Cincinnati, Ohio (Associated General Contractors); Professor H. J. Gilkey, Head of the Department of Theoretical and Applied Mechanics, Iowa State College, Ames, Iowa (American Society of Civil Engineers); and Vernon P. Jensen, Manager of Development, C. F. Braun & Co., Alhambra, Calif. (American Concrete Institute).

CONCRETE REINFORCING STEEL INSTITUTE, 38 South Dearborn Street, Chicago 3, Illinois

NEW PLANTS MEAN NEW ROADS, TOO—Building new road connection near Fairless Works in lower Bucks County, Pennsylvania.

lion ingot tons of annual capacity. Manufacturers of metals and metal products already by far are the largest industrial employers in the Greater Philadelphia-Delaware-South Jersey area, both in terms of employment and value added by the manufacture of these products.

Before the Morrisville plant was built, steel capacity in the Delaware area already was about 6 million tons, including the output from Bethlehem's 3-million-ton plant at nearby Bethlehem, Pa.

Even if no more steel mills are built along the Delaware in the next few years there is no doubt that there's going to be a lot more construction in the region during the 1950's.

• **New Jersey side**—Economists who study the area are betting that a good deal of this expansion will take place on the New Jersey side of the river. For one thing, Philadelphia and its surrounding country already is rather crowded with numerous industrial plants.

And in the last couple of years, there has been a transport revolution in New Jersey: the Jersey Turnpike has speeded up truck transportation from South Jersey to New York City. New bridges, already built or building, are further improving traffic facilities to the other side of the river, and a connection with the Pennsylvania Turnpike also is to be constructed soon.

• **Industrial district**—Just recently, a construction firm made a significant move in this direction. Mahony-Troast Construction Co., of Clifton, N. J., bought about 115 acres of land in Yardville, N. J., about five miles from Trenton and directly across the river from the Fairless Works. The company plans an industrial and commercial district, working with prospective owners and their architects in planning and constructing buildings. And Mahony-Troast will perform site selection and financing services, including disposal of the building to an investor on a sell-lease basis.

Other bridges and highways may be built before long. Just a few weeks ago, the chairman of the Delaware River Port Authority warned that there is an "urgent need" for still another Delaware River crossing, although a $90-million South Philadelphia-Gloucester bridge is scheduled to open in three years.

Back in April, the technical advisory committee on highways of the Greater Philadelphia-Delaware-South Jersey Council presented a long-range plan for 474 mi of expressways, costing $1 billion at present prices. This plan is in addition to expressways already under construction or about to be built.

• **Deeper channel**—The Chamber of Commerce believes that the one thing necessary to clinch the development of South Jersey, at least from Camden to Trenton, would be the deepening of the present Delaware channel to 40 ft. Right now, the channel is 40 ft as far as Philadelphia, and soon drops off to 25 ft. on up the river to Trenton. This, incidentally, has made it impossible so far for U. S. Steel to get big ore boats up the river to the Fairless Works. People in the area hope that Congress soon will appropriate enough funds to get dredging started. The job will take an estimated three or four years to complete.

However, an appropriation bill for funds is bogged down at this point in congressional committee. The Corps of Engineers has suggested that the government pay for dredging the channel to 35 ft at an estimated cost of $55 million, and then have local interests (such as U. S. Steel) pay half the cost of dredging down to 40 ft. This would cost about $36 million. So far, U. S. Steel is strenuously resisting that idea.

A further complication: The possibility that deepening the Delaware's channel might damage fresh-water wells on shore by forcing salt water into the ground-water strata. This has aroused considerable opposition to the further deepening of the channel. The question now is being studied by engineers.

• **More than new plants**—There's more to this new construction than just the building of new plants. Under the rural or semi-rural conditions which have existed in counties like Bucks in Pennsylvania, and in Burlington or Gloucester counties on the other side of the river in New Jersey, a new plant means a lot of other construction.

Though many workers can be hired locally, some outside people usually must be brought in. That means new homes, stores, schools, roads, and sewers—and when the plants are big enough—new power plants, rail facilities, hospitals and telephone exchanges. ENR already has pointed out (May 15, '52, p. 51) what has been happening in lower Bucks County since Big Steel started building the Fairless Works there.

The same problems of zoning, financing of new schools and other civic facilities will come up in the New Jersey counties before long. The difference is that these municipalities will have had a better chance to prepare themselves to meet these problems.

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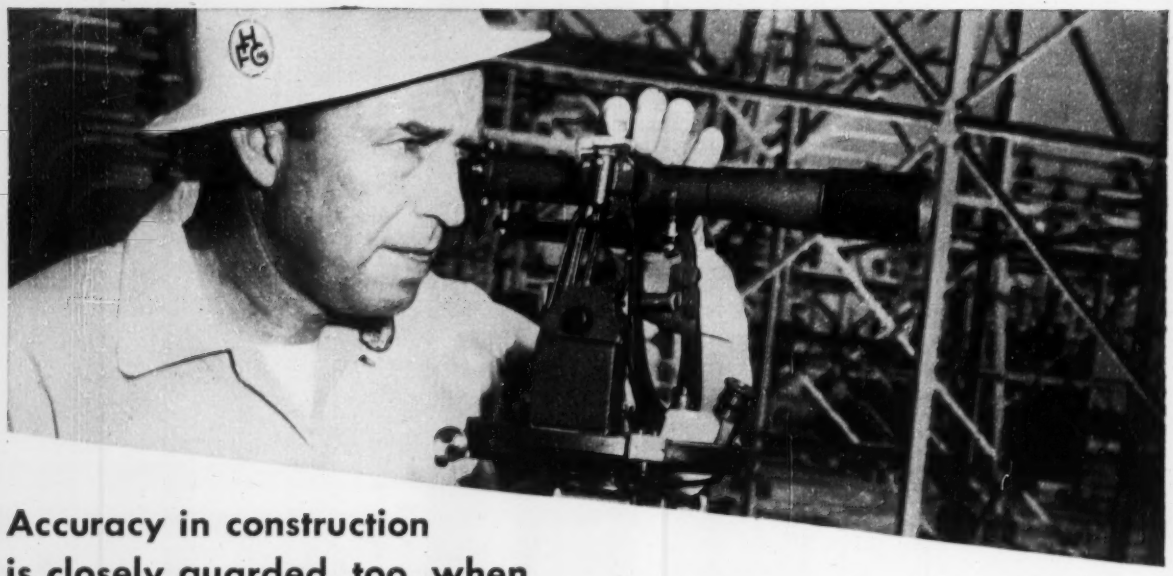

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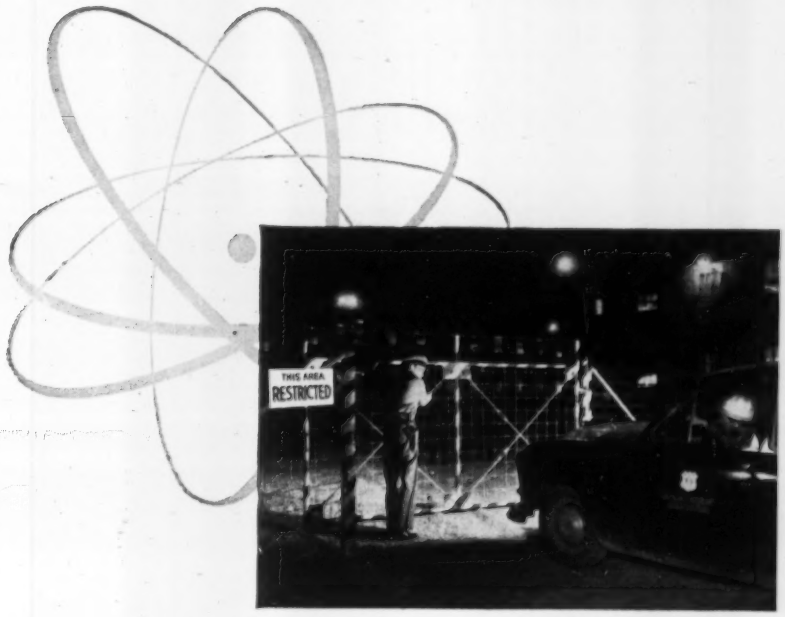

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"Two Berger Theodolites were used to establish a horizontal grid system of a very high accuracy for the entire project and also lay out the main control axis lines of negative expansion on the large process buildings, within a tolerance of .000" to .016".

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"These instruments have achieved excellent results and are still in use."

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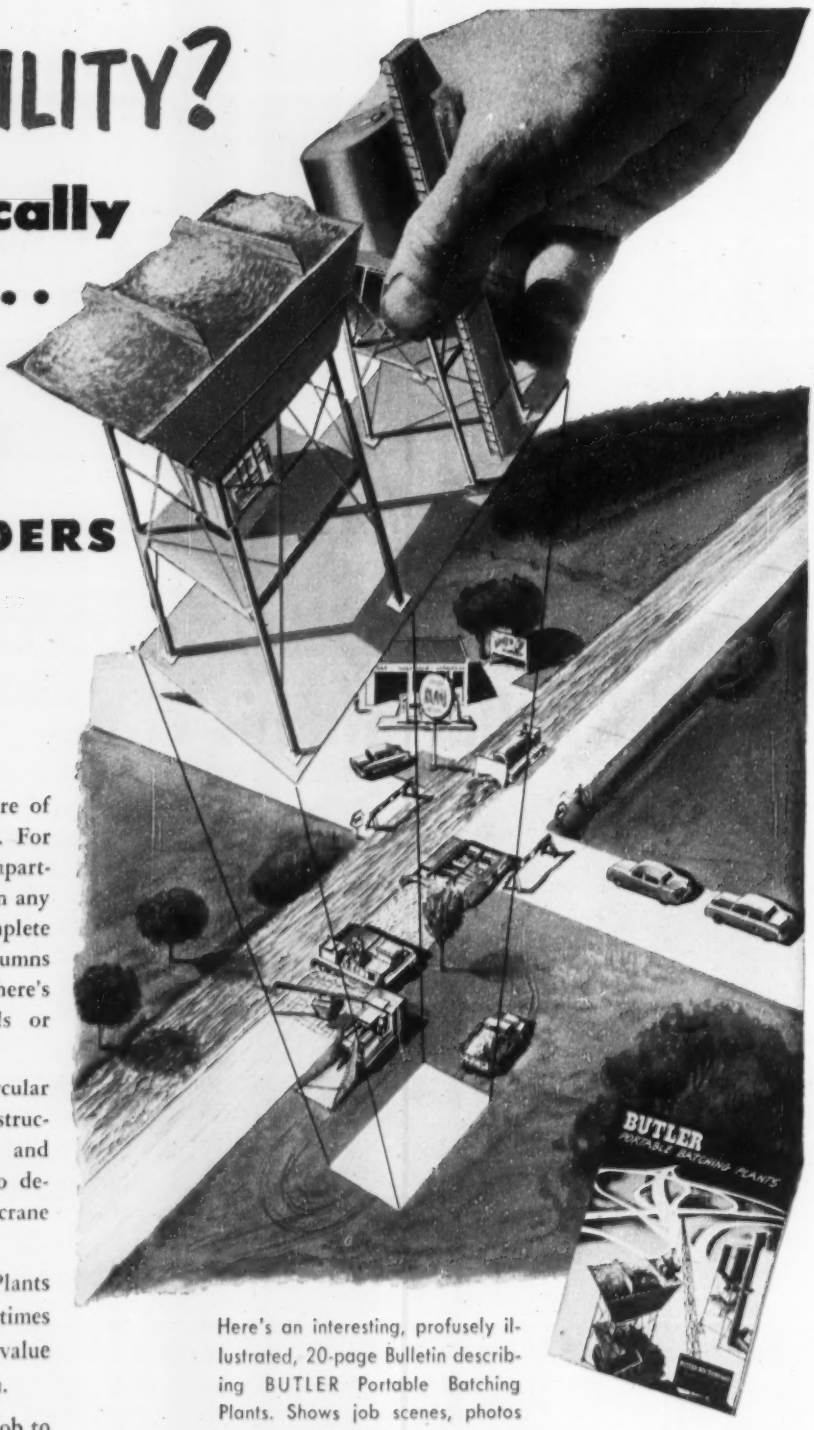

Portability is a *designed* feature of BUTLER Roadbuilders Plants. For example, the BUTLER 3-Compartment Aggregate Bin. It loads on any flat car or low bed trailer complete in one piece with batcher columns and bracing removed. And there's ample clearance for tunnels or bridges.

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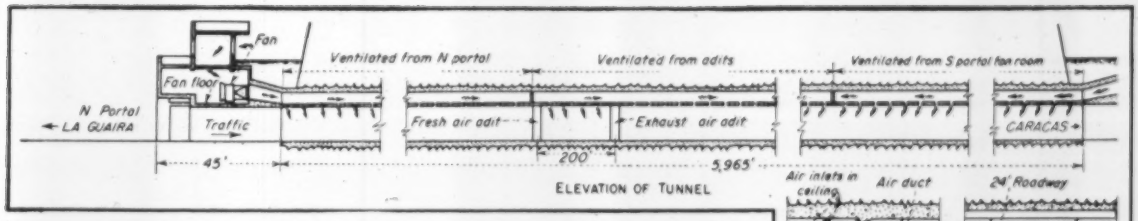
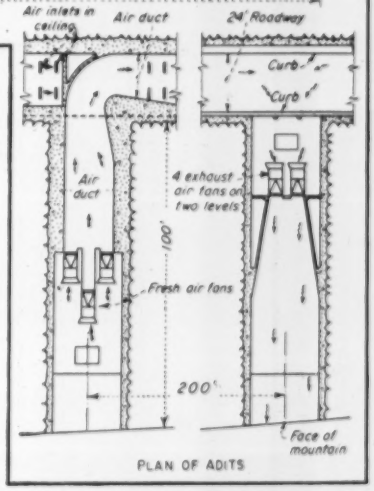




TUNNEL IS VENTILATED in three sections, from portals and from adits.

Adit fans aid tunnel ventilation

For a 6,000-ft upgrade tunnel on Venezuela's mountain expressway portal fans were not enough

Ralph Smillie
Smillie & Giffin, Consulting Engineers
New York, N. Y.

The ventilation plan adopted for the two twin-bore tunnels, which account for over one-eighth of the 10-mile length of the new La Guaira-Caracas expressway in Venezuela (ENR Jan. 26, 1954 p 30), involves the use of an overhead fresh air duct fed from fans in buildings at the portals, with the exhaust air moving out along the roadway. But while this arrangement sufficed for both bores of the shorter tunnel—and for the down-grade bore of the longer one—it was inadequate for the long upgrade bore.

Sufficient fresh air could be supplied to this tunnel from the portals only at unduly high velocities. Reducing these velocities by the use of a separate exhaust duct along the tunnel was a possibility except that the extra excavation would have been extremely costly.

The solution finally effected was to drive adits to the face of the mountain at one of the quarter points of the tunnel and equip them with force and exhaust fans. One-third of the tunnel length could thus be ventilated from the adits, with the remaining two-thirds served from the portals.

All fans are of vane axial type, the twenty 72-in. blower fans and the four 84 in. exhaust fans making this the largest installation of this design in existence.

The two tunnels are identical—twin bores, each with a 24-ft roadway carrying two lanes of traffic in the same direction. The longer is 6,055 ft portal to portal and the shorter 1,634 ft. The tunnel cross-section is horseshoe-shaped with concrete lining. A ceiling slab 14 ft above the roadway surface separates the driving space from the air duct in the arch.

• Portal blowers generally adequate—Because the city of Caracas is 3,000 ft above the sea level at La Guaira, the greater part of the highway is on a 6% grade. The tunnels, however, are 3½%, which facilitated ventilation of the up-grade sections. Actually, from a ventilation standpoint, the shorter tunnel presented no problems. A single ventilation building is located at the northerly end, from which fresh air is blown directly into the duct over the roadway.

Pairs of air ports consisting of transverse slots in the ceiling slab, spaced a minimum of 16 ft on centers, admit fresh air to the roadway space. To facilitate concreting, these slots were made of constant width, with the length varying to compensate for variations in pressure in the air duct. Three fans furnish air for the up-grade tunnel and two for the down-grade. Fresh air, after mixing with exhaust gases, passes longitudinally along the roadway space and out at both portals.

The longer tunnel could be ventilated in a similar manner for the down-grade portion, but for the up-grade, which needed more air, undesirably high velocities would have resulted both in the air duct and in the roadway. In general, vehicular tunnels of this length on up-grades are ventilated by the transverse method, which requires two air ducts: one for fresh air and one for exhaust. If air velocities, and, consequently, horsepowers are to be kept within reasonable limits, however, the second air duct necessitates additional excavation and hence a more expensive tunnel.

• Adits the solution—Fortunately, the long up-grade tunnel came near enough to the mountainside at one point so that horizontal side drifts or adits were possible. Two such drifts were driven about 200 ft apart at the one-quarter point of the length of the tunnel. This point was selected not because it was best from the standpoint of ventilation, but because at any other location the drifts would have been too long to be economical. At the point selected, the distance to the mountainside was about 100 ft which provided ample length to house the necessary equipment, but was short enough to be reasonable in cost. For simplicity the cross-section of the drifts was made the same as that of the main tunnel.

One adit furnishes fresh air to the air duct over the roadway while the other exhausts vitiated air. For this reason separate drifts were required so that short-circuiting of air would not result, and vitiated air be drawn back into the system.

Since the drifts were located at the one-quarter point, the tunnel was naturally divided into three ventilating sections of somewhat unequal length. One extends from the north portal to the drifts, whereas there are two longer sections between the drifts and the south portal. The two end sections are fed from a ventilation building at each portal while the center section is fed from the drifts. In this way maximum duct length and air velocities are kept within reasonable limits.

• Portal buildings—The three portal ventilation buildings are of similar design. They are of reinforced concrete construction, using large panels of lined forms for exterior finish. At the roadway level between tunnels there is space for emergency wrecking equipment, while the fan floor is immediately above the tunnel ceiling and spans both tunnels.

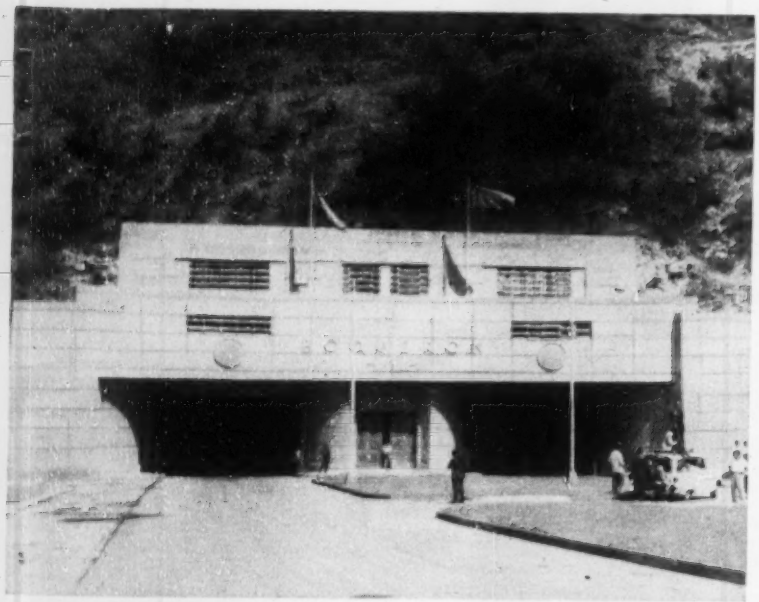
Fresh air is taken in through screened openings at the rear of the building away from the portal to eliminate the possibility of short-circuiting

(*Continued on page 40*)

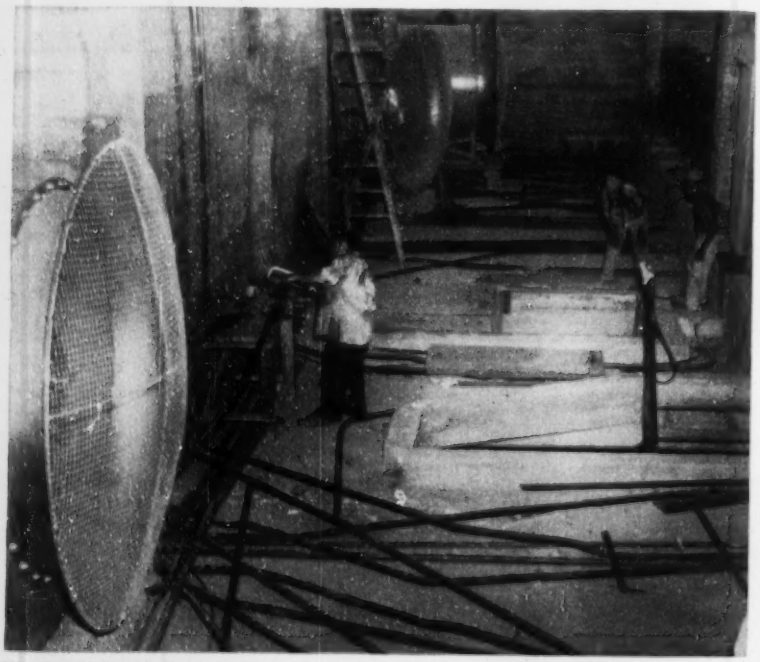
. . . Adit fans aid tunnel ventilation

exhaust air. The fans, which are all blowers in the portal buildings, blow directly into the concrete tunnel air ducts through short steel plate transition sections. Each fan has a motor-operated louver damper. Damper blades are sheet aluminum bolted to steel shafting mounted on ball bearings.

In general, there are three fans on each duct. However, on the downgrade section of the short tunnel, there are only two, and in the exhaust drift there are four.



TUNNEL PORTAL is surmounted by ventilation building, fresh air being drawn in at rear to avoid exhaust air coming out along roadway. Boqueron or "big mouth" is name of the gorge followed by the highway.



INSTALLING FANS in one of portal buildings before finished floor of fan room is put down. These are blower fans. Only exhaust fans are in one of the adits.

• **Fan characteristics**—All fans are of the vane axial type. Hubs and blades are of cast aluminum. Vanes and housings are sheet steel. Wheels are of two sizes to meet varying conditions, the smaller being 72 in. in diameter and the larger 84 in. Duty varies between 88,000 CFM at ¾ in. pressure for the smaller units to 208,000 CFM at 2⅜-in. pressure for the larger.

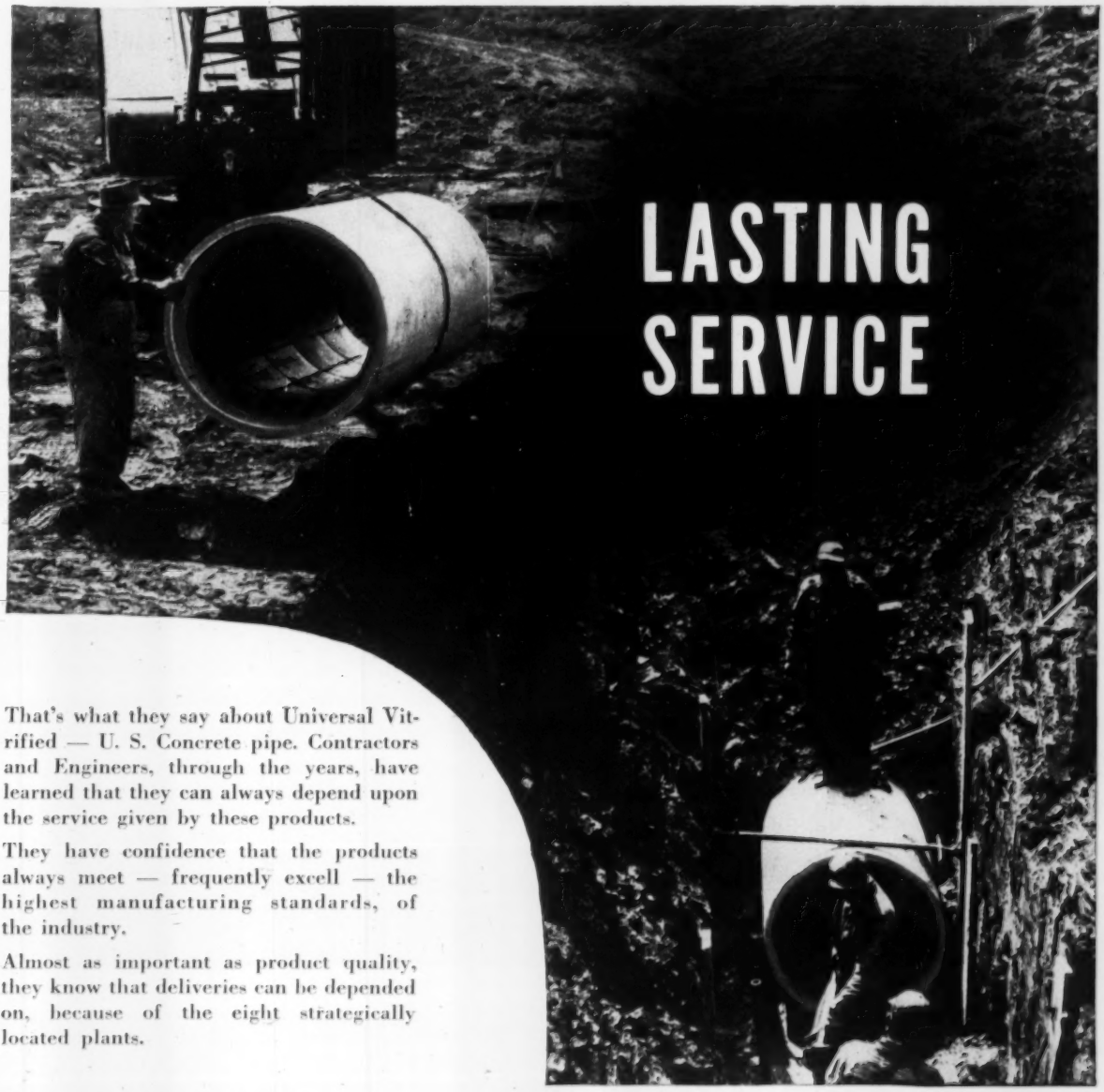
As all fans are required to operate in parallel their characteristics are such that they operate at pressures well below the stall point. When all 24 fans in the two tunnels are operating at full speed they are capable of handling 3,328,800 cubic feet of air per minute.

The smaller units are driven by two-speed squirrel cage motors mounted inside the hub fairing, directly connected to the fan wheel. In order to get speed variation in the larger fans, however, they are driven by two motors in tandem mounted in front of the fan. The larger of the full speed motors is of wound rotor type to limit starting current. The smaller motor, which operates the fan at one-half full speed, is of squirrel cage type direct connected to the large motor.

Economy of operation requires that air quantities be varied to suit traffic conditions in different parts of the tunnels. As an aid to this operation, recorders are placed near each exit portal and at the exhaust drift to give a continuous record of carbon monoxide in the tunnel air. This record appears on potentio-meters on a central board located in a control building near the south portal of the longer tunnel. All fans are remotely controlled from this same board so that all essential operations can be handled easily and efficiently by only a single operator.

Electrical energy for lighting and ventilating the tunnels is furnished from two substations located near the most northerly and most southerly tunnel portals. Energy is supplied to the ventilation buildings and drifts at 4,800 volts, and subsequently is stepped down to provide 550 volts for motor drive.

The expressway or "Autopista" was built by the Ministry of Public Works of the Venezuelan government. Drs. Girardo Sanson and Louis D. Chataing were directors and Dr. Henrique Siblesz, director-administrator, was in direct charge of the entire project. Morrison-Knudsen Co. was contractor on excavation and lining of the tunnels. Cardone Asociados had the contract for the ventilation buildings and equipment. Joy Manufacturing Co., Pittsburgh, supplied the fans. Smillie & Griffin, consulting engineers, New York, prepared the designs for the tunnels.



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ENGINEER: Paul Prince & Associates, Dover, Ohio

CONTRACTOR: R. O. Darling, Mansfield, Ohio

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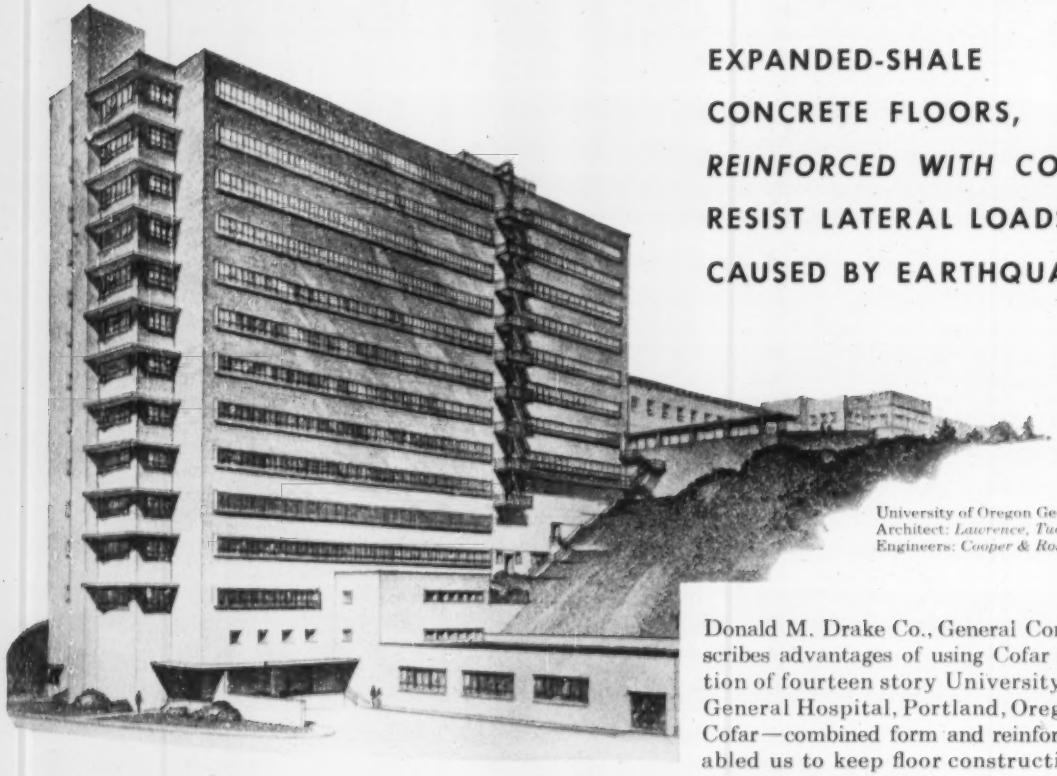
COFAR keeps pace with fast bolted frame construction in new Oregon Hospital

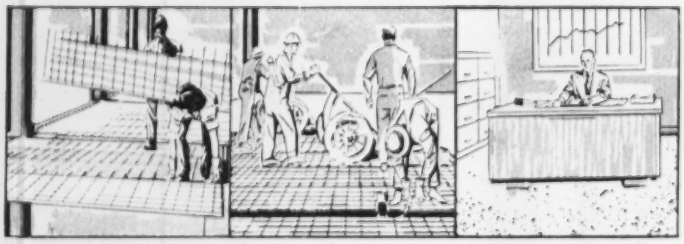


EXPANDED-SHALE CONCRETE FLOORS, *REINFORCED WITH COFAR,* RESIST LATERAL LOADS CAUSED BY EARTHQUAKES

University of Oregon General Hospital
Architect: *Lawrence, Tucker & Wallman*
Engineers: *Cooper & Rosé*

Donald M. Drake Co., General Contractor, describes advantages of using Cofar in construction of fourteen story University of Oregon General Hospital, Portland, Oregon: "Using Cofar—combined form and reinforcement, enabled us to keep floor construction moving ahead 'on schedule' *immediately behind* rapid bolting of framework! By reducing over-all erection time, speeding-up the placement of concrete and insuring faster occupancy of the completed structure, Cofar provides economies in the floor system which benefit the owner, the architect and the contractor!"

Cofar deep corrugated steel units (with transverse temperature wires welded across the corrugations) serve as both form and reinforcement for concrete slabs, completely eliminating the expensive and time consuming construction of wood forms and provide all the positive steel needed in the structural concrete slab. For information, estimates or costs on *your* building project, contact home or district office, attention Dept. ER-E.

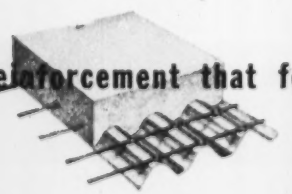


Placing steel and form in one operation—Cofar steel units (with transverse temperature wires welded across corrugations) arrive at job site cut to length to fit building frame. When welded in place, they give frame added lateral strength.

An immediate working platform—High-strength steel permits Cofar to absorb construction abuse. Corrugated sheets serve as tight form for wet concrete. After concrete sets, Cofar provides complete positive reinforcement at bottom of slab.

Safe, strong concrete floors—Fast Cofar construction speeds occupancy, is suited to steel or concrete frame construction. Cofar monolithic floors provide complete plate action for concentrated loads and horizontal forces. Cofar is fire safe.

the reinforcement that forms



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MASSIVE CONSTRUCTION of walls, floor and roof characterizes telephone center in White Plains, N. Y. The building is dominated by a 200-ft-high microwave relay tower.

Telephone building made bomb-resistant

Concrete walls 10 in. thick faced with limestone and lined with tile or foil-backed rock lath will protect personnel and communication equipment against blast and radiation

Frederick S. Merritt
Associate Editor

At low cost, American Telephone and Telegraph Co. is incorporating high resistance to blast and nuclear radiation in its new building in White Plains, N. Y., 24 miles north of New York City. In shelter areas in the interior, occupants will be safeguarded by the equivalent of at least 18 in. of reinforced concrete, and communications equipment will be unusually well protected.

The $5.5-million structure will house the eastern area headquarters of the Long Lines Department, formerly located in New York City. It will enable long-distance telephone traffic between New England and the rest of the country to bypass heavily loaded facilities in New York. This move is part of an overall dispersion plan to provide more alternate routes, so that telephone connections can be made even though a switching center may be put out of operation by natural disaster, enemy attack or accident.

The new long-distance switching center was constructed in two 6-story sections with a 200-ft high, 30-ft square microwave relay tower between them on the street side. Total length of the building is 288 ft. One section is 130 ft deep, the other, 86 ft.

Equipment is being installed on the first three floors of one section, with office space on the upper three floors. Offices are planned to occupy all of the other section.

Main entrance to the building is at the base of the microwave tower, which contains elevator lobbies and stairs. Passenger elevators for the first section are in the tower. Additional elevators were incorporated in the second section.

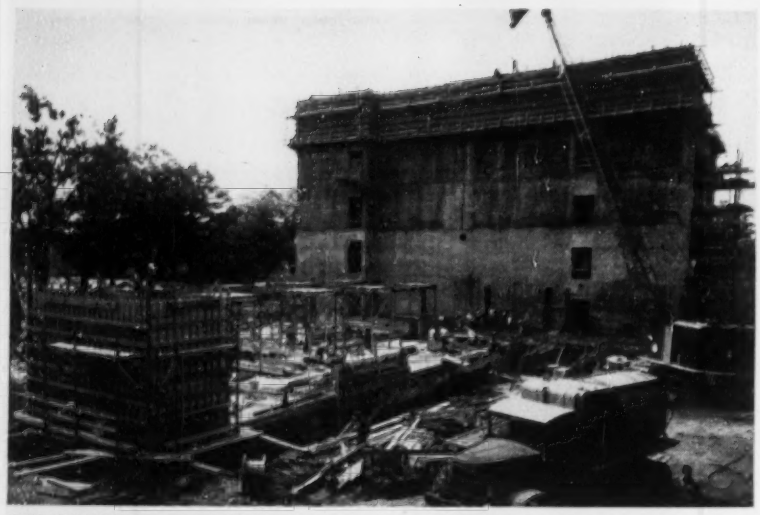
Foreseeing the possibility of future bombing attacks, the owners requested the designers to minimize the vulnerability of the building to blast and radiation from nuclear missiles.

• **Blast design**—The building was designed in accordance with requirements of Federal Civil Defense Administration's "Interim Guide for Design of Buildings Exposed to Atomic Blast Load." This assumes adequate protection against explosion of a nominal (20,000-ton TNT-equivalent) atomic bomb ½ mile from ground zero and ½ mile high. Because of the short time available for design, equivalent static loads were used instead of dynamic.

For structural analysis of the effect of lateral loading, the engineers employed their own modification of a method originally suggested by Hardy Cross, formerly professor of civil engineering at Yale, in which sidesway and joint rotation are assumed to occur simultaneously. After one cycle by this method, all joints were in balance and story shears were out of balance by only 0.2% to 7%, the larger errors being in the upper stories.

The 200-ft tower, though self-supporting, proved to be exceedingly

(Continued on page 44)



CONCRETE WAS PLACED for the walls in story-high wood forms while plastic-coated plywood was used for the flat slab floors and roof.

stiff. The engineers had no difficulty in designing it to resist blast loading. Deflection at the top was limited by operating requirements to ½ deg, but this requirement was easily satisfied.

Tower walls are reinforced concrete, 14 in. thick, faced with limestone. Floors also are reinforced concrete.

There was a minor problem, however, at the base of the tower, where openings had to be provided for entrances and lobby. It was solved by flanking the lobby with concrete columns containing triple, interlocking, spiral reinforcing.

The two 6-story sections of the building, separated from each other by an expansion joint, are of flat-slab construction, with drop panels. Typical floors are 6½ or 7½ in. thick, while thickness of drop panels is 12 or 13½ in. The slabs are reinforced adequately at top and bottom in anticipation of lateral forces that might cause a reversal of the bending expected from vertical loading.

Concrete for the floors and roof was placed in forms made of plastic-coated plywood to obtain a smooth finish. In equipment areas, undersides of slabs were painted to serve as ceilings. The upper surfaces were finished monolithically and covered with linoleum.

Columns are spaced about 20 ft apart. They generally are 2 ft square, spirally reinforced and without capitals.

The structure is founded on soft rock. It was necessary to set a 4-in. thick concrete sealer on this rock as soon as it was exposed, to prevent it from deteriorating before footing concrete could be placed. Also, a sealer 2 in. thick was laid under floors on ground to facilitate placing of reinforcement.

Water was encountered 4 ft below grade, so the entire basement had to be waterproofed. For this purpose, an iron-type material was used. The structure was not stable against uplift until the first floor was completed.

• **How walls were built**—The two 6-story sections are enclosed with reinforced concrete walls 10 in. thick. To resist blast forces, these were designed as flat plates and were stiffened with pilasters on column lines. Edges of openings also were thickened.

For added strength to resist anticipated shock loads, all reinforcing bars were hooked, to assure adequate anchorage at their ends. Where splices were necessary, bars were lapped 40 diameters, instead of the minimum permitted by the ACI code.

Concrete was required to have an ultimate compressive strength of 3,500 psi in 28 days. The mix was 1:1.8:3.2, with about 6½ bags of cement per cu yd of concrete, ¾-in. maximum size gravel (1½ in. in foundations and retaining walls) and 5.3 gal of water per bag of cement. Slump was 4 in. An air-entraining agent was incorporated at the mixer, and in hot weather a plasticizing agent also was added.

Wall concrete for both sections of the building and the tower was placed in lifts equal to a story height. To prevent segregation, tremies up to 10 ft long and spaced about 10 ft cc were employed, so that the free fall of the mix never exceeded 5 ft.

Wall forms were made of wood sheeting nailed to studs spaced 16 in. apart and braced with pairs of 2x4 wales also spaced about 2 ft apart. As the walls went up, inserts were placed in the concrete to serve as anchors for the exterior limestone facing. Forms were panelized to facilitate rapid stripping and shifting by crane to the next story.

At the front and sides of the building, walls are faced with 4-in. thick limestone. On the inside of the concrete wall, but separated from it by an air space, is clear-glazed structural facing tile for equipment areas, or two-coat plaster applied to foil-backed rock lath for offices. The rear of the building is faced with brick. The thickness of inner and outer facings on the concrete walls increases the latter's ability to stop radiation from nuclear weapons.

• **Wall openings**—Windows are relatively few and small. There is only one per bay, and it is about 5 ft high and 8 ft. wide, with two vertical mullions. Sash is steel. It is glazed with fine-wire glass, for resistance to heat.

The center section in each window is fixed. The two outer sections can be opened for cleaning, when desired. Plans call for covering the openings with ¼-in. steel blast plates, bolted in place from the inside when a bombing attack is imminent.

Doors mostly are flush hollow metal type. At the main entrance, however, they are heavy tempered glass in stainless steel frames.

• **Shelter areas**—In the event of bombing attack, the central core of the building can serve as a shelter area. There, occupants will be protected by the equivalent of at least 18 in. of concrete. A telephone operators' room on the second floor and a medical suite on the fifth floor, bordering on this core, also will be enclosed in concrete, to protect the occupants of these spaces. Baffled entrances are provided to the shelter areas in the core.

The designers anticipate that the doors will be kept open during a raid. But if there is danger of air-borne radioactive particles entering afterward, as indicated by detectors, doors will be closed and sealed with tape. Permanent sealers were considered but omitted because they might be worn out in normal use and thus not function properly when needed.

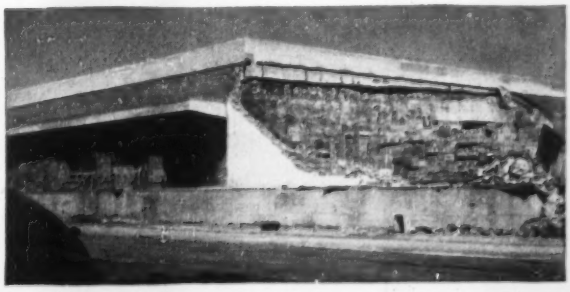
• **Protection costs little**—All provisions for blast protection, including blast plates for the windows, are estimated to have increased construction cost of the building less than 5%. Most of this increase results from the employment of thick concrete walls for the exterior and other important enclosures, as well as for baffled entrances to shelter areas. Another important portion of the added cost is due to the additional reinforcement

(*Continued on page 48*)

Though 50% of this block was destroyed, the Roosevelt Hotel (background) with reinforced concrete frame and floors came through undamaged structurally.

Reinforced Concrete Construction Withstands Destructive Waco, Texas Tornado

Above: Two-story building at right with reinforced concrete floors, walls and roof came through the tornado without structural damage but the adjacent structure suffered extensively. Below: This one-story warehouse was built in two sections. The section with reinforced concrete frame, floors and roof was undamaged; the other part was demolished.



The tornado that struck Waco, Tex. on May 11, 1953 killed 115 persons and wrecked property worth millions of dollars. It ripped a path of destruction one mile wide and four miles long.

Nevertheless some buildings within this area of devastation withstood the full fury of the tornado. An engineering report made following a thorough examination of the damage said, "Without exception structures with reinforced concrete frames suffered little damage."

This is graphic evidence that reinforced concrete construction can "take it." Schools, hospitals, factories, office buildings, apartments —any structure—can be designed in concrete to resist the violent lateral forces and bursting pressures of tornadoes, hurricanes and atomic blast.

In addition reinforced concrete construction offers the durability, strength, firesafety, attractive appearance and ***low annual cost*** that are desirable in any structure. For more information write for a copy of free, illustrated literature, distributed only in the United States and Canada.

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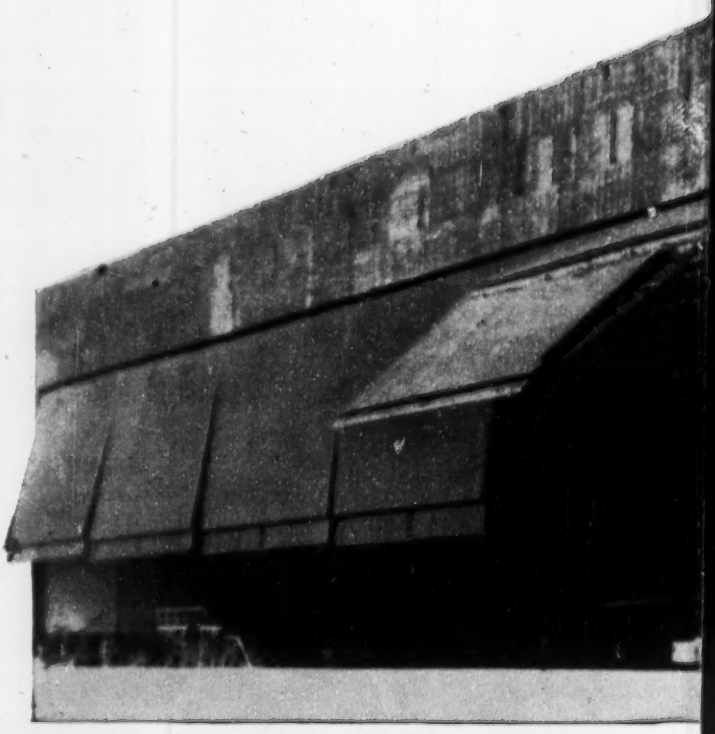
Two of these mammoth Tele-canopy doors form the sides for the huge new hangar at Lockheed Aircraft Corporation-operated Government Aircraft Plant Number 6 at Marietta, Georgia. Each door consists of eight leaves, or sections. Each section weighs *50 tons*. Any of the leaves can be raised or lowered independently, or all eight can be operated simultaneously. In order for these sections to operate smoothly and join perfectly, they must be rigid and strong—must retain their shape under frequent operation and under all conditions of wind and weather. That's why USS Structural Steel was chosen to do the job.

Structural Steel will withstand more abuse than other structural materials. It resists tension, compression, torsion, and shear. Enclosed in buildings, Structural Steel will last indefinitely—requiring no maintenance. Equally adaptable to riveting, welding or bolting, it can be erected in any weather in which men can work. Moreover, since steel members are fabricated indoors, weather can have no effect on the quality of workmanship.

For further information, write to United States Steel Corporation, 525 William Penn Place, Room 4387, Pittsburgh 30, Pennsylvania.



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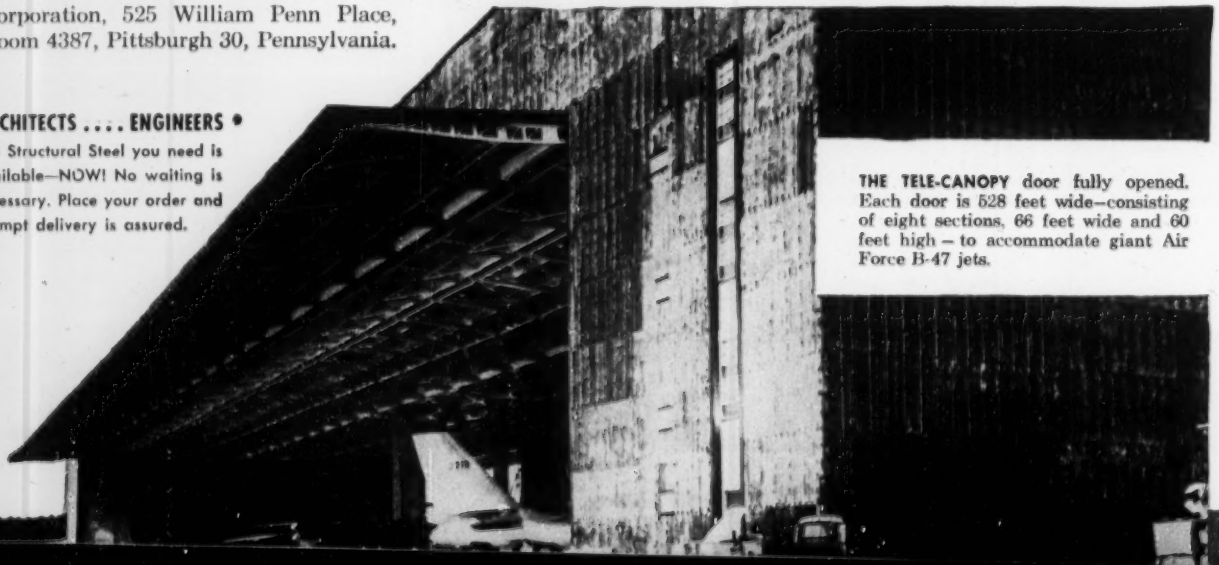
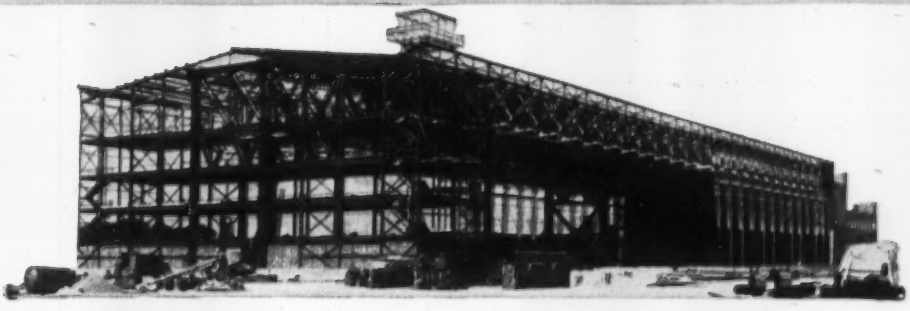


THE TELE-CANOPY door fully opened. Each door is 528 feet wide—consisting of eight sections, 66 feet wide and 60 feet high – to accommodate giant Air Force B-47 jets.

THE HUGE HANGAR DOOR in act of opening. Total operating time for the door to open or close is just 90 seconds.



THE STRUCTURAL STEEL FRAMEWORK of the hangar during erection. Notice the door sections already in place at the right end of the structure. The doors were engineered and built by International Steel Company, Evansville, Indiana, in cooperation with Robert & Co. Associates, Atlanta, Ga., Architects and Engineers. The Contractor was Blount Bros. Construction Co., of Montgomery, Alabama.

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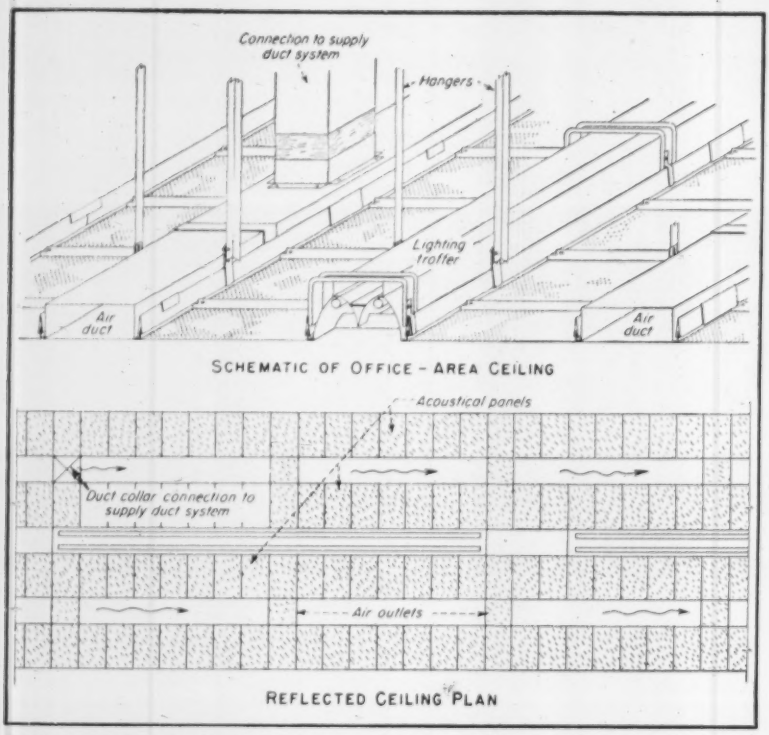


MULTI-PURPOSE CEILING of perforated acoustic tile incorporates recessed fluorescent fixtures and air ducts, which also are perforated where air is discharged into rooms. This system combines panel and warm-air heating.

in concrete floor slabs for reversals of bending moment.

• **Equipment spaces kept cool**—The building was designed to be completely air conditioned in the future. At present, however, only equipment floors are air conditioned, and office areas, mechanically ventilated.

Refrigeration is accomplished with two centrifugal compressors of 250-ton capacity apiece, located in the basement. In the compressor room also are pumps for the chilled-water distribution system. Other air-conditioning equipment, such as heat exchangers and fans, are strategically located throughout the building—in the basement to serve first and second floors; on the third floor, (a high-heat-gain area,) to serve that level; and on the roof, to accommodate the upper three stories (at present just heating and ventilating, but provision has been made for future installation of sprayed cooling coils).

Air-conditioning units in the equipment spaces consist of sprayed cooling coils, heating coils, which are supplied with steam from a central boiler room, filter sections and fans. These are enclosed in factory-insulated panels with a sheet metal interior surface, ½-in. glass-fiber insulation, vapor seal and pressed-wood exterior.

Air is supplied to the equipment spaces through the usual type of ductwork at 2,500 fpm and distributed to an exterior and interior zone. Since the owners insisted on maintaining a 14-ft clear height under ceilings, the ducts were limited to a depth of 10 in. to secure ample headroom. Hence, they are much wider than ducts usually employed in installations of this type, made of thicker material and stiffened at frequent intervals. It is also noteworthy that heat gain from the equipment is much greater than normally encountered—in one area as much as 178 w per sq ft.

A low-head, induced-draft cooling tower of 500-ton capacity was erected on the roof. Its frame was designed to resist blast loads, but the wood fill and trough were considered expendable. Replacement parts for these will be kept on hand.

• **Two heating methods combined**—In office areas, heating, ventilating, future air conditioning, lighting and acoustical treatment are integrated in a suspended ceiling. The novel design makes possible both panel heating (also future panel cooling) and warm-air heating.

Ductwork is recessed in the ceilings, as are fluorescent lighting fixtures, with the undersides flush with flanking rows of perforated aluminum acoustical tile. Header ducts feed aluminum distributing ducts that have a shiny mill finish on sides and top, for low heat emissivity. The bottom part is a pan that snaps into place. On the room side, this pan has an anodized satin finish, to improve the emission of heat. As air travels through the duct, heat is radiated to or from the bottom pan, depending on whether heating or cooling is desired.

The air is fed into rooms through perforated bottom pans that are similar in appearance to the acoustical tile. Return air is picked up at registers above the windows and behind slots in the ceiling and carried back in the plenum between floor slab and ceiling. Although the unperforated duct bottom reduces available acoustical surface about 25%, a residual sound-reduction factor of 65%—the normal design factor—is maintained.

Major advantage of this system is that from 40% to 60% less air may be required than for ordinary air-conditioning systems. Installation was simple; the ceiling is suspended directly from the structure above, eliminating cross furring.

The system was developed by Richard P. Goemann, head of the mechanical department of Lorimer & Rose, architects-engineers, while occupying a similar position with John D. Dillon, consulting mechanical engineer. Simplex Ceiling Corp. fabricated the ceilings and National Acoustics installed them—both firms having headquarters in New York City.

• **Power supply**—Electrical energy required for normal operation of building services and telephone equipment is purchased from a local utility company and is supplied from its primary distribution system via three 1,000-kva network transformers and a tie connection to the utility's low-voltage network. Service and distribution equipment in the building consists of metal-clad, low-voltage air-circuit-breaker switchgear, from which radial feeders send energy to telephone equipment.

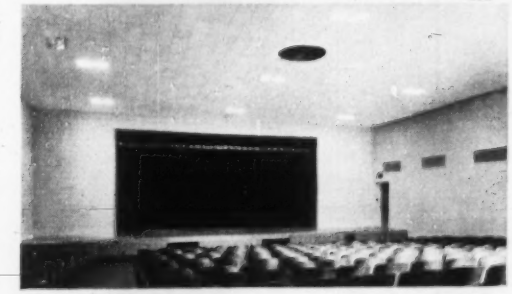
This equipment, for the most part, is energized from a rectifier plant, which converts the purchased ac to dc at the several voltages required. A standby battery plant is "floated" on the output of the rectifier plant to supply the telephone equipment during short interruptions of regular supply.

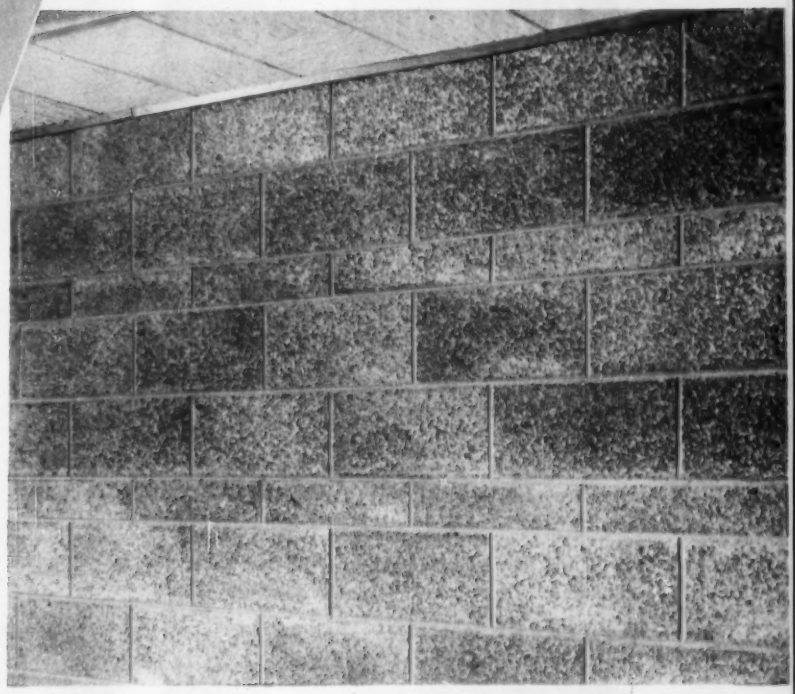
For extended emergency use, a 1,000-kw diesel-engine-driven alternator has been installed and connected to the main building distribution equipment. Output of the alternator may be switched to any part of the building or to telephone equipment.

Lorimer & Rose, of New York City, are the architects and engineers. Turner Construction Co. is the general contractor.

Build Better with VIBRAPAC Block

Detail in the office of a well-known manufacturing plant — Vibrapac Block — 2 course 8" high and 1 course 4" high. (Unretouched photo)





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NOW you can create distinctive exteriors and interiors *at low cost* . . . because VIBRAPAC Better Block combines beauty, utility and permanence that compares favorably with any other masonry material. You build a reputation with every structure you erect using this highly regarded, economical block masonry.

Consistent Exterior-Interior Masonry Harmony

Coordination of exterior and interior design are assured with VIBRAPAC Block . . . plus light structural load advantages, ruggedness, firesafety, superior insulation values and minimum maintenance cost. See your nearest VIBRAPAC Block Producer . . . or write to

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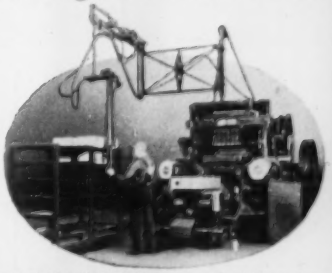

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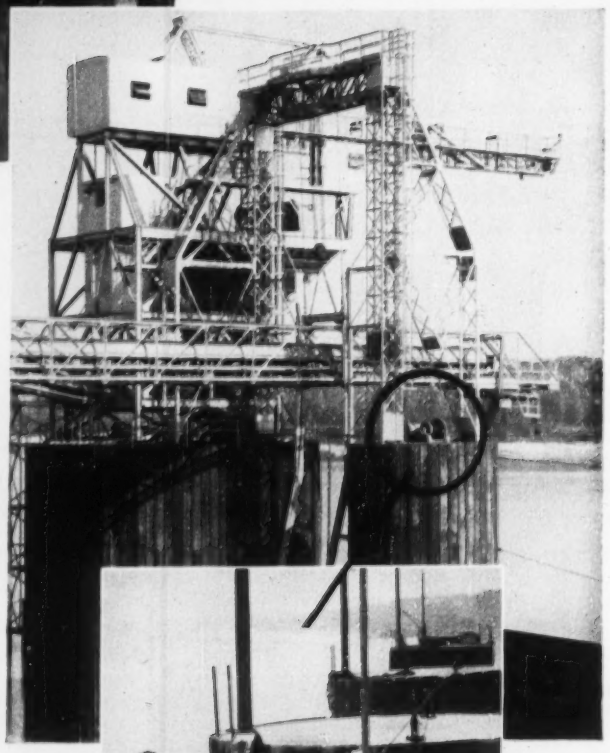
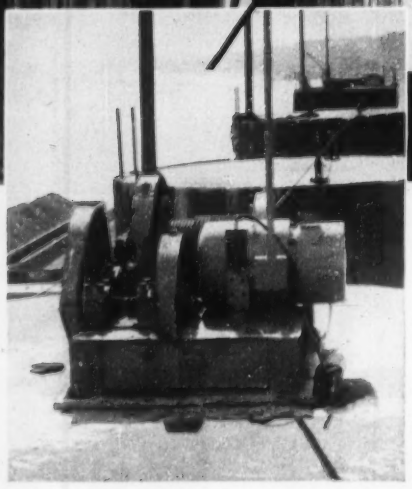
. . a Half Century of Concrete Masonry Progress!

Clyde Unloader with patented "Fleet-Block" Reeving moves materials fast in St. Louis

The St. Louis plant of the Great Lakes Carbon Corporation is well serviced by Clyde equipment. Two pier-mounted Clyde Barge Movers position the loaded barges. The Clyde Unloader transfers coal from barge to tower hopper. Then it is transported by conveyor to loading hopper where coal cars are spotted by a Clyde Continuous Rope Car Puller.





Clyde Unloader is a modern, highly efficient machine specially designed for high speed handling of bulk materials such as coal, ore, grain, chemicals, etc.

FASTER CYCLES . . . GREATER PRODUCTION

Clyde's patented "Fleet-Block" reeving provides horizontal bucket travel as trolley traverses in or out on the boom. This permits the use of light weight, large capacity standard buckets with larger pay loads. No need of heavy, expensive, "fleet-through" buckets. No bucket drop to overcome as trolley nears hopper . . . faster, easier operation with less horsepower consumption.

SIMPLIFIED CONTROLS . . . EASIER OPERATION

Two master switches control bucket hoisting, lowering and trolley travel. Push buttons in top of each lever give thumb control of bucket holding and closing lines. Limit switches protect against accidental over travel and provide safe and foolproof operation.

Many other important features of Clyde Unloaders invite your careful study for large volume material handling applications.

WRITE TODAY for complete information. The services of our skilled Engineering Department are available to help you profitably solve your material handling problems.

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CLYDE IRON WORKS, INC.

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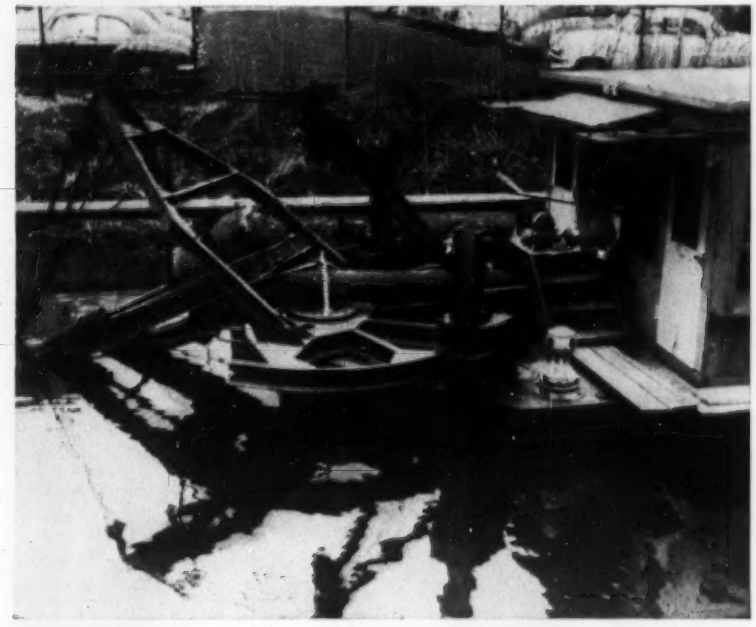
Subsidiary of Barium Steel Corp.



STRUCTURAL STEEL SPUDS (center foreground) pin dredge to canal bottom as craft works. Turntable allows wide swing of cutters at a 45-deg vertical angle.

Special problem—tailor-made dredge

Industries in two towns benefit as power packed hydraulic dredge cleans out source of water supply

By L. W. Blackburn
Chief Engineer
Ohio Department of Public Works

The Ohio and Erie Canal, once an important inland waterway from Portsmouth, Ohio, on the Ohio River, to Cleveland on Lake Erie, has fallen into disuse. The Summit Lake level of the canal, extending from Wolf Creek Lock in Barberton, Ohio, to Lock No. 1 at Exchange Street in Akron, is at present maintained by the state, and provides industrial water to some of the largest industries in the two cities.

This particular section traverses a highly industrial and residential area in both cities, and since it also serves as a storm water outlet, dredging is a continuous requirement.

The Ohio Department of Public Works has tried many dredging and cleaning methods on the canal. In 1938 it purchased a floating dipper dredge that dipped the dredgings out and placed them on the banks. But because the material frequently washed back into the canal bed, it had to be trucked to the disposal point.

Not only was it difficult to get trucks in and out of the congested area, but constant complaints by city officials that undrained bottom material caused littered slimy roads in the area, forced DPW heads to seek a better method.

• **Strict design limitations**—The problems of narrow rights-of-way, narrow channel, low bridges, narrow locks and long hauls to disposal areas made it difficult to operate conventional dredging equipment.

The engineering division of the DPW, therefore decided that a hydraulic dredge could be designed to meet the rigid requirements. First, they planned to pump dredgings to the disposal area—swampy lands around Summit Lake. This meant a long pumping distance—maximum 9,500 feet—and there was some doubt as to whether enough power could be packed into their confined hull to pump the maximum distance.

Fifteen-ft.-wide canal locks and bridges with a 10-ft. clearance above normal water level were the limiting features to the size of the unit, so finally it was decided that a booster station would be required at approximately the half-way point.

A satisfactory design for the system was completed with aid of the American Steel Dredge Co. (subsequent low bidders for the dredge).

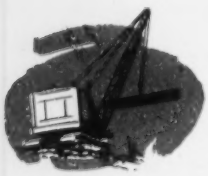
• **This was the solution**—The contract for the dredge, machinery for the booster station and fabrication of a pontoon line went to the ASD Company for $147,390. The state's Department of Public Works decided to install the shore line pipe, and the

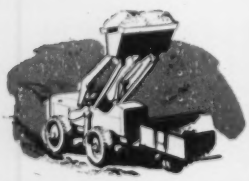
(*Continued on page 54*)

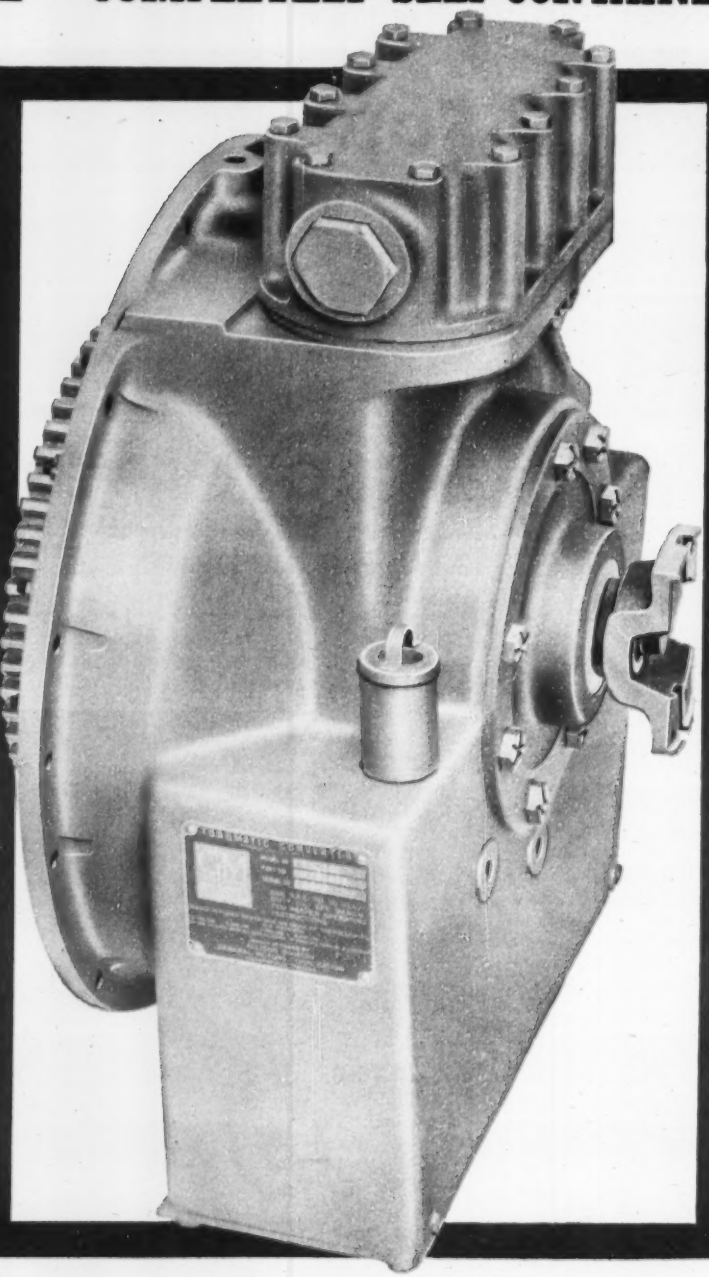
TWO KIDS' OPINION—When dredgin' interferes with fishin'—stop dredgin' . . .

NOW LOW-COST HEA

EASY TO INSTALL **COMPLETELY SELF-CONTAINED**







VY-DUTY TORQMATIC CONVERTERS

For 40-150HP Gasoline- or Diesel-Powered Equipment

HERE, for the first time, are Allison TORQMATIC Converters designed for hard-working gasoline- or Diesel-powered equipment in the medium horsepower range.

These new torque converters are true heavy-duty units *priced to compete* with converters designed primarily for passenger cars—*priced to sell for less* than most comparable industrial-type converters.

And they fit your equipment with little or no change in your design.

Easy installation

New Allison TORQMATIC Converters are completely self-contained for simplified flexible installation—feature integral oil system including charging pump, oil cooler and oil sump. No outside oil lines required. Integral gear drive for easy mounting.

Standard SAE #3 mounting dimensions and conventional internal-external drive gear like that used in ordinary clutch power take-offs simplify installation.

Three different models give you a wide selection of torque ratio and capacity.

Options include front disconnect clutch and adapter, rear disconnect clutch adapter, standard flange as shown, industrial shaft with or without governor drive and oil cooler.

Why use a torque converter?

Your equipment lasts longer with an Allison TORQMATIC Converter transmitting power because it protects engines and driven equipment from harmful shock loads—one of the main causes of equipment breakdowns.

And you get more work from your units, too. New Allison TORQMATIC Converters multiply engine torque up to 3½ times and also provide more production because they broaden your engine's effective horsepower range. When torque output equals load demand the TORQMATIC Converter acts as a fluid coupling to conserve fuel and boost engine life.

Ask your engine or equipment manufacturer about Allison TORQMATIC Converters for your hard-working 40- to 150-horsepower units or mail the coupon.

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When inverted, Milcor Roof Deck becomes a permanent floor form for concrete slabs.

To provide permanent floor forms, Milcor Steel Roof Deck is laid inverted over structural members — ribs upward, smooth surface down —easily nested and lapped, then welded in place.

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- You cut clean-up costs; interlocking deck prevents concrete dripping and seepage.

Wherever plastered ceilings are not required, the smooth steel deck surface forms an attractive, economical ceiling.

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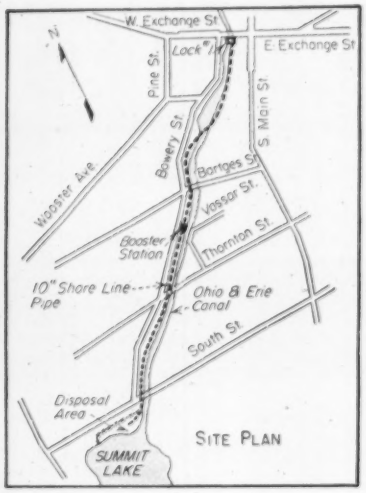

Howe Construction Co., of Cuyahoga Falls, Ohio, was the low bidder for the cement block booster station building (on a concrete foundation), bid at $8,500. Low price for 8,500 ft of 10¾-in. spiral welded pipe with couplings was $18,000 quoted by Armco Drainage & Metal Products, Inc.

The 8-in. dredge and booster station are capable of dredging 82 cu yd per hour of sand, silt and mud from a depth of 6 ft.

• **The dredge**—The dredge hull is composed of three pontoons bolted together, one at the forward end of the dredge to support the turntable and ladder assembly, and two bolted along the centerline and attached at their lead end to the forward unit.

A 600-gal. fuel oil tank is installed in each of the after pontoons. All pontoons are constructed of ¼-in. steel plate with structural steel stiffeners. Over-all dimensions are 54 ft. long x 14 ft.-6 in. wide x 4 ft. deep, and when fully loaded the craft draws three feet of water. A six-inch watertight coaming is provided above the main deck for additional free-board.

The deckhouse is constructed of 3/16-in. steel plate panels. Its dimensions are 38 ft. x 14 ft. x 8 ft.-6 in. high.

Two structural steel (H section) spuds, controlled from the main hoist, are mounted on either side of the turntable. When the dredge is in operation, these two spuds are pinned to the canal bottom to prevent side-to-side movement of the dredge.

Air controlled ratchet locks keep the spuds penetrated into the bottom of the canal. The rear spud is a structural steel telescoping member, also

raised and lowered by the hoist. It is pinned at its upper end, allowing pendulum-like movement fore and aft, for accurate control of forward movement of the dredge.

A three-hp winch at the forward end of the dredge pulls it ahead as operations progress along the canal. It has a line speed of approximately 10 ft. per minute.

• **Machinery**—The dredge pump (identical with the booster station pump permitting interchanging of parts) is a heavy duty carbon steel pump with a capacity of 2,325 gpm to a dynamic head of 200 ft. at 920 rpm. It is direct-drive connected by flexible coupling to a diesel engine rated at 325 hp at 920 rpm.

A diesel-electric generator rated at 50 kw, 440 volt, 3 phase and 60 cycles generates current for all auxiliaries on the dredge.

An oil-fired furnace heats the deckhouse during the winter months.

On the hoist there are four 9-in.-dia. drums for ladder, hoist, and the operation of the three spuds. Two 14-in. drums are used for swinging the turntable and ladder. The hoist has manual controls for frictions, with brakes located directly behind the drums. It is powered with a 5-hp motor with a 3:1 speed variation.

The ladder is located on top of the turntable and the cutter shaft is driven through suitable gearing by a 20-hp high torque electric motor.

The flexible suction hose, connecting the ladder piping to the hull piping, has sufficient flexibility to permit the ladder to move in a vertical angle of 45 deg. and a horizontal angle of 60 deg. to either side of center. Horizontal movement of the ladder is controlled through the turntable by 3/4-in. swing lines.

Twelve-watt transceivers provide an open communications system between the dredge, the booster station and the disposal area. An amplifying speaker is used on the dredge for immediate reception.

These 2-way FM radios insure the balance of pump speeds essential for positive control of discharge velocities, vacuum and spoil bank operation. The rapidly changing quality of canal waste compels frequent and instant speed changes and emergency stops, and the limited disposal area requires careful management.

• **The booster station**—The booster station, on the west bank of the canal, is 15 ft wide x 23 ft long. The booster pump, duplicate of the dredge pump,

(Continued on page 56)

ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS

Shoring system and beams support wall of existing structures
Bay unexcavated - to save underpinning of structure later to be demolished
Access to subway is underpinned and maintained

Project: Rebuilding Jordan Marsh, Boston Department Store, a section at a time.
Contractor: Thompson Starrett, Inc.
Architect: Perry, Shaw & Hepburn
Engineer: Maurice A. Reidy

CONTINUOUS MAT PUT IN FAST AS BIG STORE REPLACES ITSELF

This project had to be handled in separate sections, so that the store could continue doing business during construction. Section II, a 200 x 94 ft. portion of the property, is shown above with the highlights noted. It was necessary to use extreme care in the installation of the 30 ft. high system of pilot beams and horizontal sheeting to prevent movement of adjacent buildings and streets.

The drainage problem was simplified by our installation in Section I of a drainage system which had the capacity to remove the water of both sections.

Have you a foundation problem? We would be glad to talk it over. Catalogue on request.

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PAT. U. S. A.

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TIRFOR GRIPHOIST

CAPACITY 3300 LBS. (Single line)

TO 10 TONS WITH MULTIPLYING SHEAVES

Now—with the portable, manually operated, TIRFOR GRIPHOIST—you can do the work of winches, winch trucks, chain hoists and ratchet hoists. Thousands of these versatile machines have been ordered and re-ordered in the U. S. They're used by General Construction Contractors, Steel Erectors, Electrical Contractors, Truckers, Industrial Plants . . . wherever lifting and pulling must be done better and easier at lower cost.

EXCLUSIVE FEATURES:

UNLIMITED CABLE TRAVEL—NO REEL, NO SPOOL.

Easily carried, set up and operated by ONE man.

Speed—10 ft. per minute either direction, load fully controllable at all times. Uses ½" wire rope.

Any Position—vertical, horizontal, diagonal.

Safe—holds securely and automatically.

Weighs only 42 lbs.

Investigate the TIRFOR now. Your dealer has it or can get it. Write for descriptive Folder E today.

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Princeton Griphoist, Inc.
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544 Market St., San Francisco 4, Cal.

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Drummondville, Quebec, Canada

is equipped with a drum controller and resistors allowing a 50% reduction in rpm.

A close-coupled, 50-gpm centrifugal pump, is used for sealing water in the pump.

There is a lighting transformer and heater in the station. Metal louvers permit proper circulation through the station while in operation.

• **The floating pipe line**—The 210-ft-long, 10-in.-dia floating pontoon line consists of two 42-ft sections mounted on 38-in.-dia cylindrical tanks 7-ft-3 in. long. The remainder of the line is made up of short, 8-ft sections on flat cylindrical pontoon tanks 7-ft-3 in. in diameter and two feet deep. Each end of these short sections is fitted with a ball joint for individual movement of 22½ degrees.

The pontoon line forms a loop, then connects to the rectangular landing pontoon that in turn is connected to the shore line. Short sections and ball joints enable the pontoon line to form a 180-deg bend in the 25-ft-wide channel. A davit and hand winch on the landing pontoon enables the end of the floating line to be raised or lowered to the proper elevation for connecting to the shore line.

• **The shore pipe line**—The 10¾-in. shore pipe extends over the entire length of the canal from Lock No. 1 south to Summit Lake. It is fastened on wood piling driven along the west bank at the water's edge.

It is so anchored as to permit a one-quarter turn rotation as abrasive wear develops, thus increasing its normal life three times.

The pipe line is made up of 153-ft units, consisting of one 3-ft length of pipe (removable section) installed with a modified coupling (stops removed) on both ends, and three 50-ft lengths installed with standard couplings except where contiguous with a removable section.

The unit is installed with clearance between the 50-ft lengths of pipe in the standard couplings to accommodate expansion of the unit to 120 deg F. The 3-ft section was installed with 1-in. clearance to facilitate removal.

A spacer bar is placed axially along 3-ft removable sections to maintain the clearance between these sections and the adjacent 50-ft lengths. Tension members between these lengths prevent the clearance from accumulating at one coupling and causing a blow-out.

In starting dredging operation, the stern of the dredge usually is spotted next to a 3-ft section. Connection between the pontoon line and the shore line is made at this point. The pontoon line is arranged in a complete loop at the stern of the dredge.

Dredging then progresses 150 ft down the canal until this loop is almost straightened out, and the stern of the dredge will be opposite the next connection point. The end of the floating line is then disconnected from the shore line, the new connection is made and the dredge proceeds down the canal to the next connection.

• **Results of tests**—Originally it was planned that the velocity in the discharge line would approximate 9½ ft per sec. However, actual tests have shown the pipeline velocity to be between 15 and 16 fps through the booster station, and between 11 and 12 fps in the southern half of the canal where the booster station is not used.

The actual output of the dredging unit thus has exceeded the original calculated requirements.

Comparative operating costs between the old dipper dredge method and the hydraulic dredge cannot—at this time—be determined accurately because the greater efficiency of the hydraulic dredge has uncovered so many bedsprings, water tanks, tires, cans, bricks and timbers that were missed by the dipper. As a result, the dredge has had an excessive amount of shutdown time for removal of such objects. This condition will prevail until the entire canal has been traversed by the dredge.

Even now, however, there is evidence that present costs will be far lower than with the former method.

Los Angeles to buy acreage for parks and public bldgs.

The Los Angeles, Calif., council has voted to acquire from the federal government for $1,522,948.22 the two public housing sites abandoned last year in a compromise settlement of the city's bitter housing controversy (ENR Aug 20, 1953, p. 68). The council voted to pay half the cost at once and the rest in installments.

The city plans to use the two sites (about 400 acres) for recreational facilities and public buildings. Some of the land may go to the state or county for public use.

Nine housing projects of the eleven originally planned—4,357 units instead of the original 10,000—are being completed under the compromise settlement.

(*Municipal continued on page 58*)

Lick 30% grades on San Fernando Freeway

8 C Tournapulls average 1040 yds. per hour on 1500′ hauls

Follow the leader — Dragging their blades, Tournapulls roll down 35% grade on way to fill. Powerful disc air-brakes provide more braking surface on 1 wheel than most haulers have on all 4.

When *J. Tomei & Sons Construction Co.,* Van Nuys, California, have a tough job to handle, they always rely on Tournapulls. This was the case on the 1,400,000-yd. relocation and rebuilding of Highway 99 as a freeway in Weldon Canyon, near San Fernando.

In this rugged mountain area, grades ranged up to 35% favorable on the haul and 30% adverse on the return. Job consisted mainly of cutting to grade through tops of a series of hills and filling in roadbed in valleys between them. Material included sand, sandstone, clay and shale. To handle all the dirt-moving, Tomei brought in 8 C Tournapulls. Here's how they performed on typical cycles:

Deliver a load every 41 seconds

Push-loaded with 13 pay yards, each Tournapull hauls 1500′ down the 35% grade to the fill. "C's" completed 3000′ cycles every 5.5 minutes, in spite of the 30% grades on return. Each moved 10 loads per 55-min. hour, for a combined hourly output of 1040 pay yards.

Get all the facts

Find out how Tournapulls can give you increased production in *any* material, under *any* conditions. Let us show you . . . we can back every claim with performance.

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- Fully Compressible
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Ideal for large concrete structures or masses where substantial initial contraction is anticipated before any considerable amount of expansion takes place. 50% expansion beyond original thickness after compression keeps joint space filled, regardless of concrete movement. Made in ½" to 1" thicknesses; 2" to 12" (Standard) widths; also made in 24" and 36" widths on special order.

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MUNICIPAL

Highway crossing

Dangerous problem is solved with corrugated metal tunnel

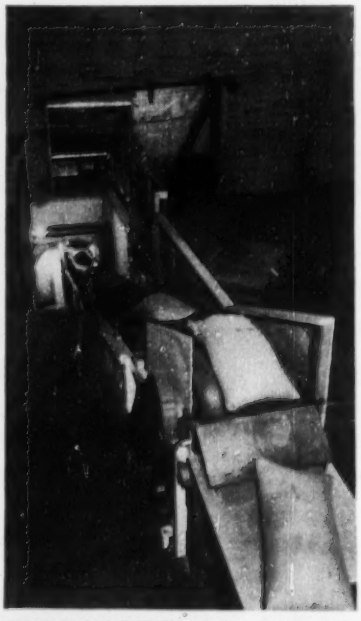
A steady progression of tragedy and near-tragedy that started in 1942 brought together the forces of California highway engineers, the engineering department of the Link-Belt Company and officials of a California seed company to lick a knotty highway-crossing problem.

Two men lost their lives and Eckhart Seed Co. lost a truck in a rail accident in 1942. The firm revamped its rail loading facilities to make it unnecessary for seed trucks to cross the tracks. But troubles had only begun.

• **The problem**—Route U. S. 101, at Eckhart's plant location south of Salinas, Calif., separates the plant from its rail siding. When the route was a conventional 2-lane highway, the passage of company trucks was dangerous enough but as traffic volume on the road grew, the state began planning conversion into a 4-lane limited-access freeway.

District V engineers studied the problem at length, but no solution was forthcoming until a tunnel was suggested as a possible way out. It was at this time that Link-Belt was brought into the picture.

• **Two-phase construction**—With the



TWO-WAY RIDE may be obtained by reversing the belt's direction.

tunnel decided upon, and a conveyor recognized as the most satisfactory solution, open-cut excavation for the tube was planned in two stages.

The east portion was cut and 90-in. corrugated metal pipe placed when the new northbound lanes were being built. The western half was completed when the existing two-lane highway was resurfaced to serve as the southbound freeway lanes.

Two hundred feet of pipe were placed with a concrete floor. Reinforced concrete wells and stairs were built at each end, completing the work by the state.

Installation of a 2-ft by 500-ft conveyor belt with a 7½ horsepower motor with gearhead drive was accomplished for $15,000.

Operation is relatively simple—lift trucks bring outgoing cargo (usually 100-lb sacks of processed beans, peas or seed) to the east end of the conveyor. One man loads the belt and two men at the siding end transfer the sacks to the waiting car. One 30-ton freight car can be loaded with 600 sacks in an hour.

Rapid rearrangement of certain chutes and short feeder belts permits reversal of the main belt to handle incoming cargo.

Two seed company drivers have been transferred to other departments, two trucks are now for sale and traffic flows uninterrupted on Route 101.

Study may speed tube traffic

A 10-man committee has been named by New Jersey Governor Robert B. Meyner to study ever-increasing traffic conjestion on the approaches to the Holland and Lincoln tunnels under the Hudson River.

The governor said he realized that the study committee would be handicapped in the amount that it could accomplish, but he pointed out that even a few minutes saved during peak hour waiting would be helpful.

He also said that the third tube of the Lincoln Tunnel—now under construction—would not be completed for at least three years, and by that time, "it will take care of no more than the ordinary traffic increase expected during the period."

The study committee, headed by Arnold H. Vey, director of the state's Bureau of Traffic and Safety, will be composed of men from bus, automobile and trucking interests together with representatives of the Hudson County, N. J., board of freeholders, State Highway Department, Port of New York Authority, and the New Jersey Turnpike Authority.

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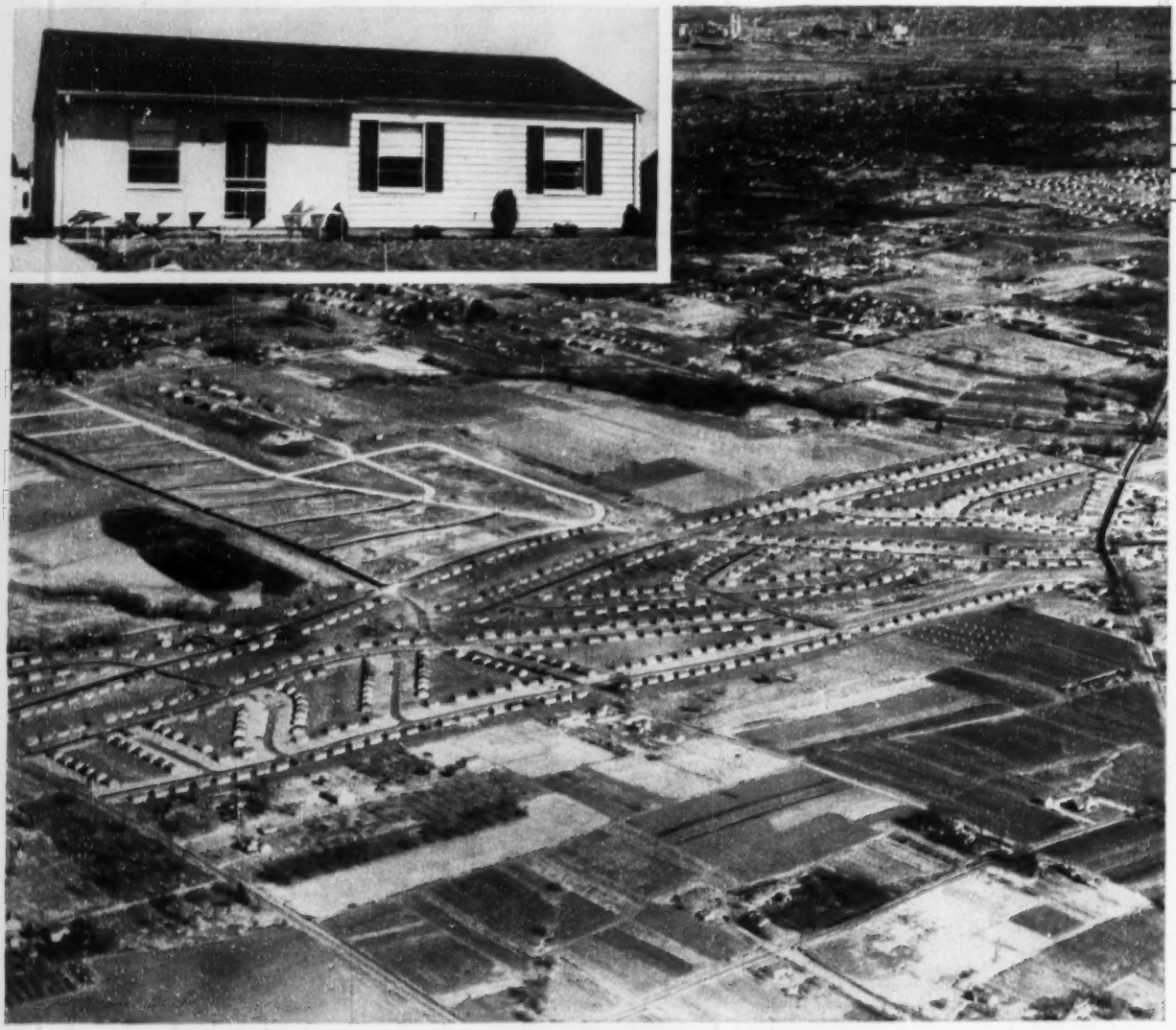

Sweet music to any contractor's ears: 250 modern, comfortable homes like those above were built by Winn-Rau Corporation in Kansas City, Kansas last year without loss of a single man-day!

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By Mr. Friendly

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Bricks and stones to break their bones,
Bulldozers, pliers, high voltage wires...
And not a single lost-time accident all year long!

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Investigation of highway department reveals road boom at root of trouble

Ontario road bureau's inability to cope with demand seen as major factor in paying contractors more than bid price

Booming demands for roads that have more than tripled highway work in the province in the last six years are at the root of major irregularities now under investigation in the Ontario, Canada, Department of Highways, an engineers' report to the provincial government said last week (ENR May 20, p. 26).

The magnitude of the "irregularities" is indicated by the fact that several employes of the department have been arrested and now face trial; indictments have been issued against three major roadbuilding contractors and a number of individuals.

Additionally, a May 17 report by the provincial auditor pointed out that in 1950 alone, contractors had been paid more than $16 million in excess of their bid prices on contracts amounting to about $35 million. The auditor also reported evidence that junior employes in the department had destroyed "important documents" shortly after irregularities began to come to light in the fall of 1953.

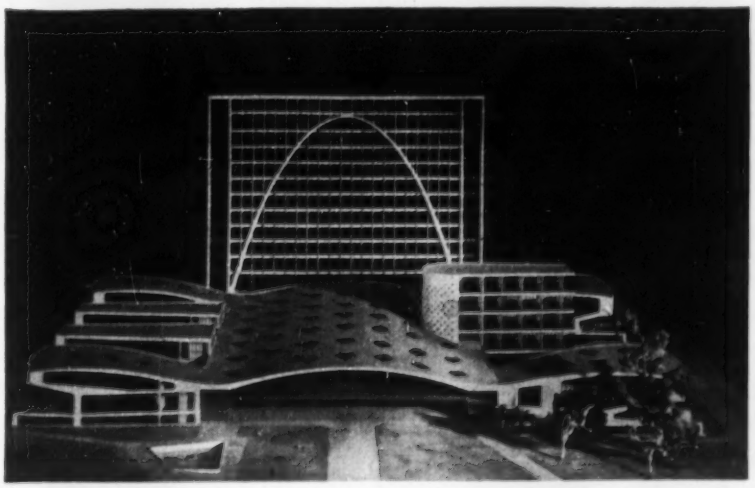
A special committee set up by the provincial legislature to investigate the highways department has employed the Toronto management consultant firm of J. D. Woods and Gordon, Ltd.

Pending outcome of court action against those already arrested or indicted, however, the commission has adjourned its hearings.

• **Root of the trouble**—Huge and sudden expansion of the highway program is clearly indicated in the Woods-Gordon firm's 64-page report as the major cause of the trouble.

The consultants cited interim reports on the department's operations submitted by the provincial auditor, who pointed out that expenditures of

(*Continued on page 64*)



Argentina to build new engineering school

To provide facilities for 6,000 science engineering and architectural students, the Argentine government will construct a highly integrated center incorporating engineering, architectural, physics, chemistry and mineralogical departments. Central court of the new school buildings will have reinforced concrete arched vault roof with a clear entrance at one end of 295 ft. Huge diamond-shaped skylights will provide daylighting in the court. Along either side of the 394-ft long court, will be two large amphitheaters at the ground level, along with smaller classrooms, laboratories, and offices throughout the basement, ground floor and two upper stories reached by stairways. At one end of this central section a 14-story building will be built to provide offices, laboratories, and some classrooms.

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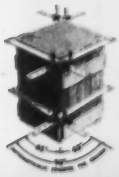

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the department in 1947 were $46 million, but reached $150 million in 1953, to make the department the largest spending unit of the Ontario government.

"Lack of adequate and systematic planning, and failure of the department to meet the challenge presented by a rapidly developing province made possible the financial irregularities now under investigation," said the report.

"In the rush to keep up with work, the department departed from its own priority lists, and had no time to carry out necessary preliminary engineering work with projects added to initial lists. In some cases, the time allowed was only sufficient to map out a rough route, and estimates were based on experience. In consequence, contractors did not always have sufficient information on which to base realistic tenders."

(Auditors had reported that one company had been paid more than 300% over its bid price, 14 firms got more than 200% over their bids. Some of the excess was charged to changes in standards, unexpected changes in quantities, change in the province's own practices regarding base courses.)

Woods-Gordon also criticized the system of awarding contracts and many aspects of the general departmental administration.

• **Personnel short**—Returning to the theme of lack of capacity to handle the work before it, the consultants comment that the postwar demand for increased highway services caught the department at a time when it was least prepared to deal with it.

Even the present engineering staff of 228 professional engineers, is 20% to 25% below strength, Woods-Gordon said, and less than half of the total staff have been with the department for more than five years.

• **Remedy**—In a series of lengthy recommendations, the consultants touched on all principal operations of the department. Briefly, they suggested:

1. A flexible, long-term plan to take account of all factors that may affect highway traffic, and to act as a framework for a program of new construction with a system of priorities and estimates well in advance of construction.

2. Prequalification of contractors.

3. All bids should be opened in public, and details of all bids be made available to all bidders.

4. Contractors should be made to adhere strictly to terms of their contracts, including completion dates.

5. Adjustments on claims for extra payments should be reviewed by a new Committee on Construction and Plans, to include the Deputy Minister of Highways, the two Deputy Ministers of Public Works, and a financial advisor. (This committee is already in existence).

6. Instant dismissal of any employe who accepts favors in any form from contractors, and "blacklisting" of contractors who offer such favors.

7. Reorganization of the administrative setup of the department to establish clear lines of responsibility and authority. This reorganization would make the chief engineer and all heads of divisions responsible only to the deputy minister. Also, the main office would contain five senior officials, under the suggested plan: the chief engineer; a director of planning; director of personnel; a service manager, and a financial controller.

Canadian N Ry will build 321 mi of branch lines

Canada's House of Commons has approved a bill guarantying a $44.5-million Canadian National Railway bond issue for building two branch railway lines, one in Quebec and the other in Ontario.

The 321-mi of new lines—expected to be under construction by fall—will provide access to mining and pulpwood areas.

The first line will penetrate 294 mi into the Chibougamou mining district (250 mi northwest of Quebec City). It will begin at Beattyville in Western Quebec to bring ore to a larger smelter at Noranda. Then—by swinging around to connect with an existing line to the Lake St. John district—it will provide a pulpwood outlet to existing paper mills.

The second line—a 27-mi one—will run south from Hillsport (200 mi northwest of Port Arthur in Western Ontario) into the Manitouwadge mining area.

Political issues may curb Kuwait's construction pace

Sheikh Adullah Al-Salem Al Sabah reportedly is anxious to slow down the pace of Kuwait's 10-year, $364-million development program. Foreshadowing a cut in construction is a recent order calling for schedules of all work in progress or planned to be submitted to the Public Works Department.

No single factor has been cited as the reason for the Sheikah's reluctance

(*Continued on page 66*)

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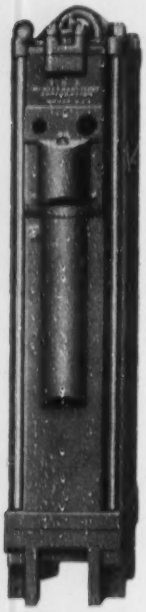
Down go steel piles to help build a 4½-mile subway—Canada's first—in Toronto. The contracting syndicate of Pitts, Johnson, Drake and Perrini selected a McKiernan-Terry Pile Hammer for the pile-driving job.



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to proceed with construction at the rate originally set. But political developments in Kuwait (a British protectorate and now Britain's chief source of oil in the Middle East) as well as in neighboring Arab states are believed to be influencing the present policy.

The government's change in policy already is affecting some of the major contracts.

Three main English contractors—London firms that have been working on important Kuwait projects since 1952—have been told that by voluntarily ending their contracts they will be able to take part in open bidding.

Particularly threatened is the Persian Gulf port project that was intended to give Kuwait the benefits of a modern harbor. The calling of bids has been postponed. The dredging contract in effect for a year has been terminated before completion.

Reports indicate that the plan to supply fresh water from the Shatt-el-Arab to Kuwait will be carried out as scheduled. (For the story of one of Kuwait's water supply projects—a seawater distillation plant—see ENR, April 16, 1953, p. 80.)

Corbetta joins Rockefellers in low-cost housing project

Corbetta Construction Co., of New York City, has teamed up with Rexach & Rivera Construction Co., of San Juan, Puerto Rico, and Rockefeller interests to build up to 2,000 low-cost, single-family homes on a 205-acre tract in San Juan. The homes, to be built of reinforced concrete, will sell for from $4,900 to $5,900.

Construction actually will be carried out by Las Lomas Development Corp., organized jointly by Corbetta Construction, Rexach & Rivera, and Ibec Housing Corp., an affiliate of International Basic Economy Corp., a venture capital company set up by the Rockefeller brothers in 1947. Corbetta is also a vice-president of Ibec Housing Corp.

Construction of the first 300 units is planned for early summer, with smaller groups following as rapidly as possible.

International briefs . . .

• **Peruvian irrigation project**—During the next two years Cia. Irrigadora Chimbote—a new firm founded by Peruvian engineers—will invest $6 million in a project to irrigate 59,000 acres of desert lands near Chimbote, Peru. The plan calls for a 30-mi-long main canal starting on the Santa

River, two lateral canals totaling 37.5 mi, and 23 tunnels. Construction of access roads and labor camps already is under way.

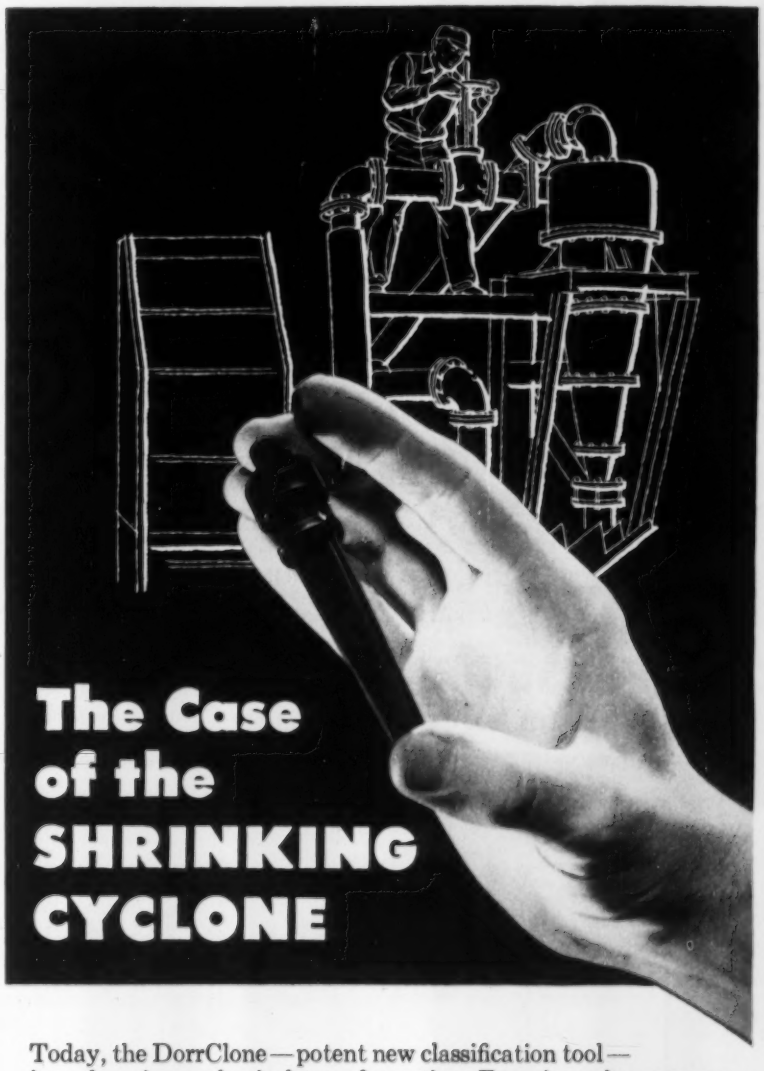
• **Andes canal completed**—Peru has opened a new $1.2-million irrigation system covering 25,000 acres along the Mantaro River in the state of Junin, high in the Andes. Centered on the city of Huancayo (about 120 mi east of Lima), the system involves a 40-mi canal carrying about 3,000 gallons of water per second. Technical studies and cost estimates for a projected power plant now are being undertaken by government experts.

• **Toronto skyscraper proposed**—A U.S. group with headquarters in Chicago (its name has not been revealed) has offered to tear down Toronto's city hall and erect a 50-story skyscraper on the site to house municipal and court offices. The group—seeking investment sources for insurance and other institutional funds—already has opened preliminary negotiations with Toronto.

• **Capital for coast highway**—Construction of a $10-million highway along Salvador's Pacific coast will be financed by the International Bank for Reconstruction and Development. The project is aimed at opening up a large undeveloped agricultural area. Meanwhile, the bank still is considering whether or not to provide funds for modernizing Salvador's Pacific coast port of Acajutla.

• **Rhodesia power project**—A World Bank mission will study the finances of the new Rhodesia-Nyasaland Federation before deciding whether to provide the major portion of the capital needed for the initial stages of hydro-electric power projects in the Zambesi Basin. Officials believe that one of these projects must be started soon to keep the Federation—particularly the Northern Rhodesian copper belt—from suffering a serious power shortage in 1960.

• **Sudan plans dam**—In 1956 Sudan is expected to start construction of a dam south of Rosseires to provide storage capacity of 3 billion cu tons. According to plans already prepared, first stage of the 6-year project will cost about $42 million; the second stage, about $60 million. (Egypt and Sudan will share the cost since the stored water will be divided equally between them.) The project would allow cultivation of more than 1,000,000 acres lying between Rosseires and Sennar Dam.



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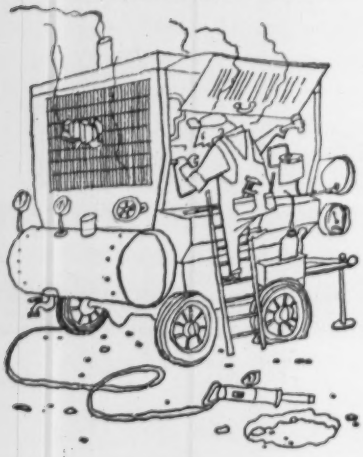

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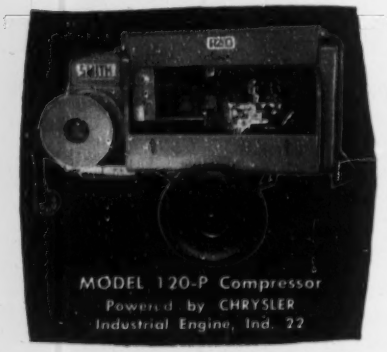

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MEN AND JOBS

India and U. S. to exchange 16 engineering educators

Under a Foreign Operations Administration program nine U. S. engineer-educators have been selected to spend the 1954-1955 school season in India helping to improve engineering colleges there.

Plans call for seven additional engineers from U. S. colleges to be selected for assignments in India—and for 16 Indian university staff members to be trained in this country.

Five of the experts heading for India in June are from the University of Wisconsin. Prof. James R. Villemonte, civil engineer, Prof. R. R. Benedict, electrical engineer, and Prof. Gerald Pickett, mechanics, will serve at Bengal Engineering College of Sibpur, West Bengal. Prof. Gerard A. Rohlich, civil engineer, will work at Roorkee University at Roorkee. Prof. Vincent C. Rideout, electrical engineer, will go to the Indian Institute of Science at Bangalore, Mysore.

The other four engineers selected are: Prof. John C. Georgian, mechanical engineer at Washington University, St. Louis, and Prof. Thomas L. Hansen, architecture and city planning at University of Colorado—both to go to Bengal Engineering College; Prof. Clarence H. Kent, mechanical engineering, City College of New York, and Harold L. Walker, consulting engineer and former professor of mining and metallurgy at the University of Illinois—both to serve at Indian Institute of Science.

Career briefs . . .

• **Steel company VP**—James M. Mead has been elected a vice-president and director of Joseph T. Ryerson & Son, Inc., to succeed Ainslie Y. Sawyer, who is retiring. Mead—formerly assistant vice-president with headquarters at Ryerson's Chicago plant—will be in charge of procurement for the company's 16 steel service plants.

• **Association appointment**—Robert G. Welch has been appointed executive secretary of the American Steel Warehouse Assn., with headquarters in Cleveland. He has been manager of distribution for Kaiser Aluminum & Chemical Sales, Inc., since 1947.

• **Engineering educators**—Two college of engineering staff members of Ohio State University have been promoted. Lawrence D. Jones has been named associate dean. Charles T. West has been made professor and chairman of the department of mechanics.

• **Utility manager retires**—Walter S. Byrne, general manager of the Omaha, Neb., Metropolitan Utilities District since 1939, retired at the end of May. He plans to go into private business, probably in the utility field.

• **Alaskan assignment**—The Department of Interior has appointed James W. Huston director of Alaska Public Works with headquarters in Juneau. Huston—a 30-year veteran of the Corps of Engineers—was resident engineer in charge of military construction at Elmendorf, Tex., Air Force Base and Fort Richardson, Alaska, from 1947 until last September.

• **Top management changes**—The Pacific Coast Engineering Co., San Francisco, has announced three changes in top personnel. C. H. Ramsden, presi-

Pollution control advisor

Thomas J. Powers, waste disposal supervisor for The Dow Chemical Co., has been appointed by President Eisenhower as industry representative on the water pollution control advisory board of the Public Health Service. Powers, who holds degrees in both civil and sanitary engineering, joined Dow as sanitary engineer in 1936 after serving five years with the Michigan Stream Control Commission. He is past president of the Michigan Sewage and Industrial Waste Association and past chairman of the water pollution abatement committee of the Manufacturing Chemists' Association.

dent since 1939, has been elected chairman of the board. Will C. Hall has stepped up from vice-president and general manager to president and general manager. C. D. Ramsden has been named vice-president and chief engineer.

• **New research post**—The Structural Clay Products Research Foundation has appointed Malcolm H. Allen to a newly created post—manager of the field engineering and development division. He has been serving as chief engineer for the Structural Clay Products Institute in Washington, D. C.

• **Engineering expansion**—As part of its expanding engineering-development program, the Asphalt Institute has picked Jean E. Hittle to fill the new position of assistant engineer of research. For the last three years Hittle has been materials engineer with the New Mexico State Highway Department.

• **Heads purchasing agents**—Henry L. Doten, University of Maine business manager, has been installed as president of the National Association of Educational Buyers. Doten, who received his engineering degree from the University of Maine, was employed early in his career by the bridge division, Maine State Highway Commission.

• **Citadel dean retires**—Col. Louis S. LeTellier, dean of The Citadel, military college in Charleston, S. C., has retired. He served as a member of Citadel's civil engineering department for 45 years, head of the department from 1920 to 1953, and acting president of the college.

• **Job in Jordan**—Thomas Dudley, builder and co-designer of the Alzada water spreading system in southeastern Montana, has arrived at Amman, Jordan, on a two-year assignment as technical assistant. His job: Helping to expand the current water-spreading program and other projects in soil conservation, forestry, underground water development and range reseeding operations.

• **Engineer Corps promotion**—Claude H. Chorpening has been promoted to the rank of major general in the Corps of Engineers and given an assignment in Tokyo with the U. S. Army, Far East. General Chorpening has just finished a tour of duty in Washington, D. C.

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Bruning Drafters are built for precision and durability, with such outstanding features as the exclusive Equipoise mechanism which eliminates drift from gravity on an inclined drawing board, engine-divided protractor, and Touch Control for automatic indexing. All moving parts turn on precision ball bearings, permanently lubricated and sealed to protect against dust and dirt.

For free booklet giving you a full description of Bruning Drafting Machines, just mail us the coupon below.

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We tear truck axles to

in the new Timken-Detroit indoor proving ground

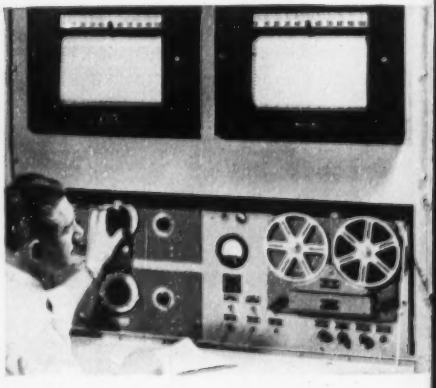
...and only Timken has it!

We smash, twist, jerk and over-load them. Match every imaginable hauling situation. Then add a few ruinous tricks of our own.

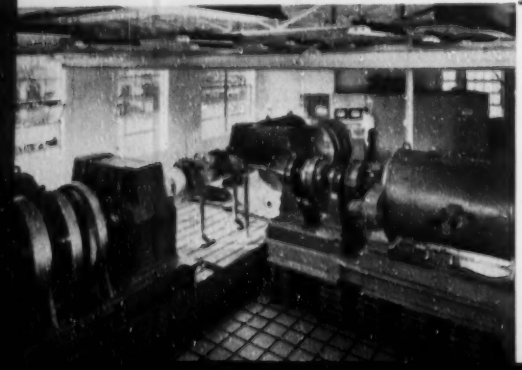
It's done on purpose. So we can tell you in advance that a Timken-Detroit axle can take a more brutal beating on the job it was designed for than any other axle made.

To prove it, we condensed a multi-thousand acre proving ground into one room. In it, our engineers can apply 50 years of experience in building axles for trucks, buses and trailers. Here axles and gearing are subjected *indoors* to any possible *outdoor* hauling condition. Axle performance is measured and analyzed under absolute scientific control!

As a result: you enjoy longer axle life; less maintenance, repairs and down-time; lower operating costs; fatter profits. No wonder Timken-Detroit axles are the choice of manufacturers and owners everywhere!

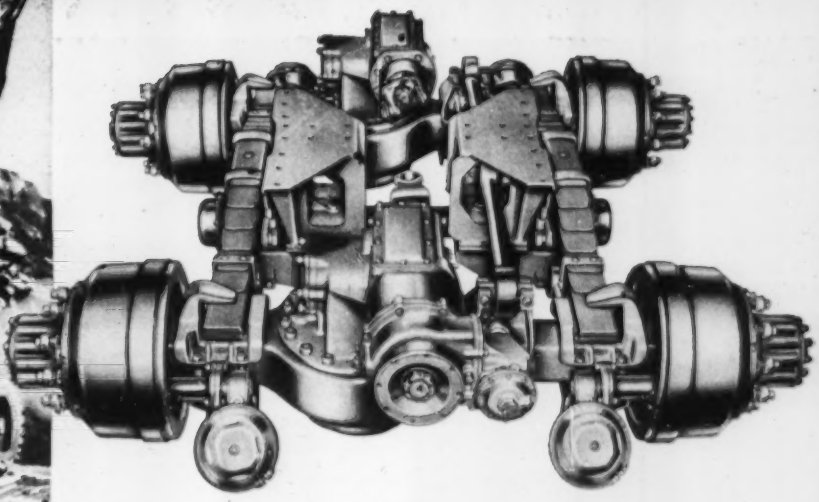


This is our "truck driver," he works in the "Torture Chamber." Above him are graphs showing speed and torque performance under any operating condition he chooses . . . soft ground at full load . . . mountains . . . express highways or side roads. With special dials, recorders and electronic devices, he actually *drives* the axle with scientific accuracy from his chair!



How TDA proves axle quality in this "Torture Chamber."

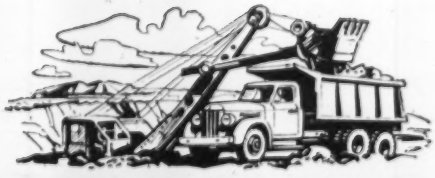
We take one of our axles and put it on the "block". . . . then duplicate the roughest hauling condition, hour after hour, day after day . . . such as simulating 500,000 miles of toughest driving in just a few days. Or we "dream up" a test like going up hill with a full load at 45 m.p.h. from California to New York—*non-stop*. There is no other axle testing like it in the world!



THREE TYPES: Hypoid-helical double-reduction, optional inter-axle differential. Worm drive, without inter-axle differential.

Soft ground? Heavy load—all up-grade? That's a tremendous strain on an axle. But it's nothing compared to what we do in the indoor proving ground! For instance—we take an axle shaft and twist it 14° forward and backward, 36 times a minute, 24 hours a day, week after week. And that's only one test to give you low-cost performance, long axle life regardless of your hauling conditions.

pieces



TIMKEN Detroit AXLES

TIMKEN DETROIT AXLE DIVISION
ROCKWELL SPRING AND AXLE COMPANY
DETROIT 32, MICHIGAN

The Accepted D A Standard

TRADE MARK REGISTERED

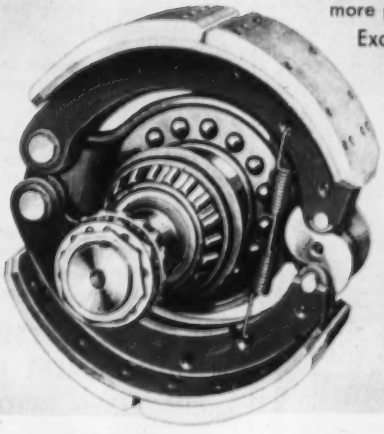
"TORTURE-TESTED"
to Save Money on the Job

WORLD'S LARGEST MANUFACTURERS OF AXLES FOR TRUCKS, BUSES AND TRAILERS

For six-wheelers . . . the TDA Tandem Drive Rear Axle Unit

Now—the *lightest weight* tandem drive rear axle unit for heavy-duty motor trucks! And with these features, developed, introduced and pioneered by TDA: (1) Available in 3 types of final drives and 3 capacities. (2) Top-mounted straight-line final drive eliminates propeller shaft angularity. (3) Optional inter-axle differential . . . spur gear design, cab-controlled power-lockout. (4) Torsion flow axle shafts . . . guaranteed for 100,000 miles or three years, whichever occurs first. (5) Hot forged steel axle housing . . . guaranteed for the life of the vehicle. (6) Unit-mounted "P" series power brakes . . . for longer life, greater economy and efficiency. (7) Cradle ride spring suspension and paralleled torque rod system . . . maintain correct alignment and weight distribution regardless of driving and braking conditions. (8) Exclusive two-piece trunnion tube bracket speeds servicing. (9) Removable torque rod and spring guide brackets . . . for positive alignment, easier replacement. (10) Rubber torque rod bushings and rubber spring seat bushings...eliminate metal-to-metal contact. Require no lubrication.

New TDA brake shoes save up to 40 lbs. per axle



• Lightweight, pressed steel construction to give you more payload plus long wear and safety. Exclusive ¾" TDA "Econoliner" brake liners held rigidly by 12 deep-set rivets per block—*not bolts*. Liners are thickest at center where greatest wear occurs—taper down at ends. Result—longer wear, greater stopping ability. New cam roller mountings never seize or brinnel. Light nylon camshaft bearings wear up to 4 times as long! It's America's new brake shoe!

Plants at: Detroit, Michigan • Oshkosh, Wisconsin • Utica, New York • Ashtabula, Kenton and Newark, Ohio • New Castle, Pennsylvania

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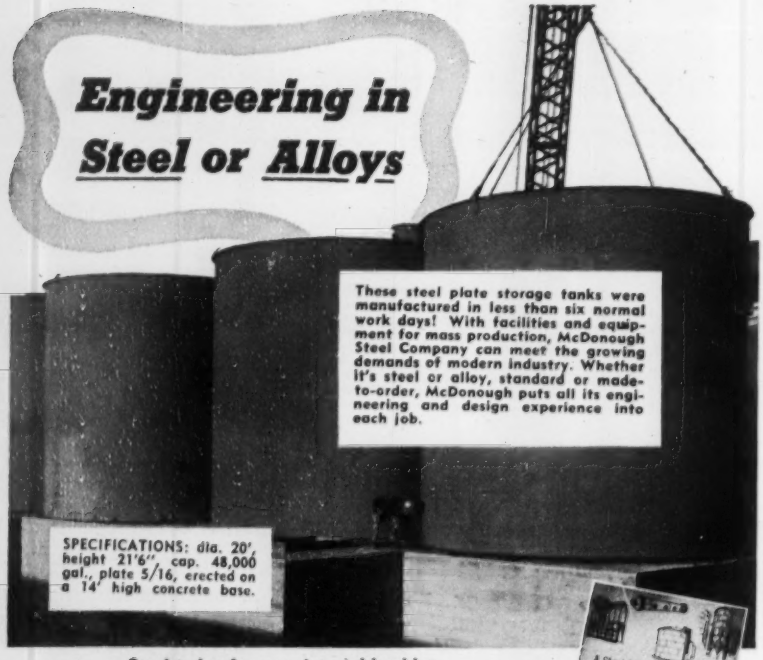

These steel plate storage tanks were manufactured in less than six normal work days! With facilities and equipment for mass production, McDonough Steel Company can meet the growing demands of modern industry. Whether it's steel or alloy, standard or made-to-order, McDonough puts all its engineering and design experience into each job.

SPECIFICATIONS: dia. 20', height 21'6", cap. 48,000 gal., plate 5/16, erected on a 14' high concrete base.

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McDonough Steel Co.

Founded January 1st 1924

ENGINEERS—FABRICATED STEEL PRODUCTS

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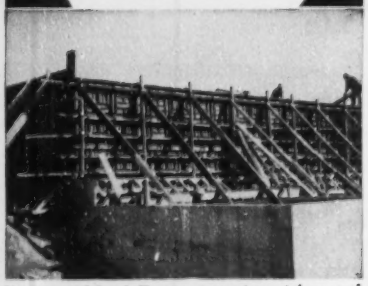
Reduce costs and

INCREASE PROFITS

by renting these metal forms for concrete



Economy Metal Forms save time, labor and material. They quickly lock together with a simple twist of a clamp. Standard units fit most jobs. Where needed, special forms can be fabricated to specification.

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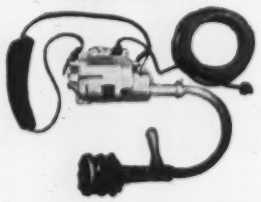
ECONOMY FORMS

metal forms for concrete construction

"BERG"

CONCRETE SURFACER MODEL A



"Berg" equipment is used extensively for surfacing and finishing applications on concrete construction.

The many "BERG" Models available, permit exact selection for your particular application.

The distinctive "BERG" features give you the kind of results that are realized in better quality work, combined with lower costs.

"BERG" Heads and Attachments are interchangeable, thereby providing adaptability for vibrating, wire brushing, sanding and polishing applications.

THE CONCRETE SURFACING MACHINERY CO.

4667 SPRING GROVE AVE.

CINCINNATI 32, OHIO

OBITUARIES

George White Caldwell, 84, of San Antonio, Tex., retired consulting engineer, died in Norfolk, Va., May 18. A graduate of Princeton University, 1894, his early engineering work was in Mexico with S. Pearson Company, Ltd., of London. He was the builder of hydroelectric projects to supply Rio de Janeiro, Brazil, Mecaxa Dam, Mexico; Medina Dam, Tex., dams in Lerida and Tremp in Spain for Riegoes y Fuerza sel Ebro. With C. H. Kearney he formed the engineering partnership of Kearney & Caldwell, New York City. He was the builder of the subway at Barcelona, Spain, and represented the J. G. White Engineering Corporation in the $60,000,000 Pesos Irrigation Program in Mexico.

Wilhelm Adrian, 68, San Francisco structural engineer, died May 9 in San Leandro, Calif. A partner in the San Francisco engineering firm of Adrian, Graham and Hayes, he was structural engineer for numerous buildings in the area, including the Tribune Tower building in Oakland, Peninsula Hospital in Millbrae, and Marine Hospital in San Francisco.

Leland B. Morris, 61, a construction engineer, died recently in Clyde, Ohio, where he had been working on the Ohio Turnpike. He was a graduate of Ohio State University and spent five years in the Panama Canal Zone as a construction engineer.

Fred V. Larkin, 71, professor emeritus of mechanical engineering at Lehigh University, died at Bethlehem, Pa., May 23. He was graduated from the University of Wisconsin in 1906 and received a Master of Science degree from Lehigh in 1915. At his retirement in 1948 he received an honorary degree of Doctor of Engineering from Stevens Institute of Technology. In 1909 he was assistant superintendent for the Empire Engineering Co. in the reconstruction of the N. Y. State Barge Canal at Spencerport, N. Y., and he worked on the foundations of the Woolworth Building in 1912. That year he began his teaching career at Lehigh. He became head of the department of mechanical engineering in 1919. In 1906 as an engineer for the Telluride Power Co., he conducted the building of one of the first high voltage electric transmission lines over the Continental Divide. Professor Larkin lectured on industrial management at the U. S. Naval Academy in 1942, and since 1944 he had been consultant to the Army Ordnance Department.

Cross Rolling*?

NOT when you use a Buffalo-Springfield 3-axle tandem!

YOU CAN MEET DENSITY AND SMOOTHNESS REQUIREMENTS IN FEWER PASSES WITHOUT CROSS ROLLING, CUT JOB TIME.

***Rolling in one direction with conventional 2-axle tandems often fails to give proper levelling results. It can leave waves or bumps that have to be ironed-out by later cross-rolling or rolling on the diagonal. All too often, material *has already set* by the time cross-rolling is done. This can cause serious internal damage to the material, can make it deteriorate quickly under traffic. Most important of all, it costs you *extra job time*.**

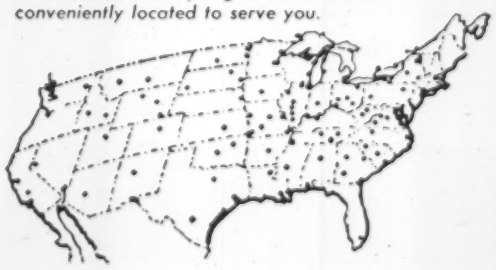
Walking Beam 3-Axle Tandems with Compaction Control completely eliminate cross-rolling, the *internal* damage to material it causes, and the extra job time it requires! You *finish* rolling material while it is pliant and workable. You can meet density and smoothness requirements in considerably less rolling time than required with 2-axle tandems!

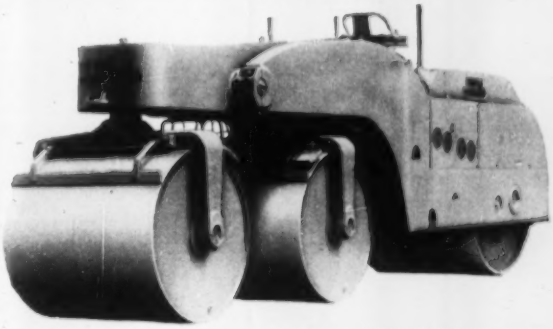
Facts from the field:

Contractors report averaging more than 60% higher tonnage compacted per day with 3-axle tandems than with 2-axle tandems doing similar work. Published records show 3-axle surface roughness indices are as much as 50% lower than state averages. And many states specify fewer rollers, less rolling time when you use Buffalo-Springfield 3-Axle Tandems!

Consider what this means to you in dollars and cents. Fewer passes, no cross-rolling whatsoever, fewer rollers to operate and maintain, lower capital investment. Jobs getting done faster and better than ever before. A real chance to cut costs and make money on those jobs you really want!
Write for Bulletin S-62-53.

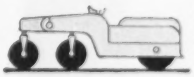
There's a Buffalo-Springfield Distributor conveniently located to serve you.





Buffalo-Springfield 3-axle tandem

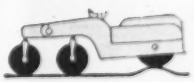
This is Walking Beam Compaction Control:



1. Both guide rolls are suspended from a single rotating beam. When the beam is "semi-locked," the end guide roll can pivot above but not below its normal position.

2. When the first guide roll encounters a high spot in the fresh material, the Walking Beam rotates to permit the first guide roll to pass over the hump exerting only its normal pressure. This "prepares" the material for the high compaction of the center guide roll.

3. Then the center guide roll rises on the hump. The "semi-locked" Walking Beam causes the entire guide end of the roller to rise with the center roll. This lifts the end guide roll off the ground, transfers its weight, along with some of the weight of the *drive* roll. At this instant, the center roll exerts *almost 3 times its normal compaction.*



4. The drive roll exerts its normal compaction as it passes over. The Walking Beam can be used unlocked for rolling vertical curves and warped surfaces. Can also be used fully locked, if desired.

See your distributor for complete information or write —

Buffalo-Springfield Roller Co.

BUFFALO SPRINGFIELD
THE STANDARD OF COMPARISON
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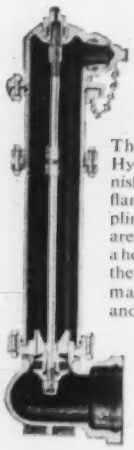
THE LEADER IN ROAD ROLLER DESIGN AND MANUFACTURE.



The R. D. Wood Hydrant can be furnished with breakable flange and stem coupling at extra cost. Both are built to break with a heavy blow. This saves the hydrant itself and makes repair quick and easy.

The R. D. Wood Swivel Joint Hydrant: All internal parts, including drain valve seat, removable through barrel • all-bronze stuffing box • completely revolving head • compression-type valve, cone shaped to prevent water hammer • automatic drain valve • bronze main valve seat screws directly into elbow with straight, not tapered threads • mechanical-joint pipe connections if specified.

Solidly Built

The R. D. Wood Swivel Joint Hydrant is designed to provide maximum reliability at lowest cost consistent with assured delivery of water at full pressure. It is solidly built and of the finest materials. Every point where rust and corrosion might interfere with operation is protected by at least one bronze surface.

R. D. Wood Swivel Joint Hydrants

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Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

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Manufacturers, also of Diamond Core Drilling Machines and complete accessory equipment, including all types of Diamond Drilling Bits. Ask for Bulletin 320.

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LEGAL

Limits on actions by owners against subcontractor

The owner of a building brought an action against the general contracting corporation that put up the building to recover the cost of labor and materials required to correct defects in the structure. The general contractor, claiming that the defective work had been performed by a subcontractor, asked that in the event the owner obtained a judgment against it, that it be granted a judgment against the subcontractor. The application was denied, and this determination was affirmed on appeal.[1]

The appellate court, in its opinion indicated, that while the owner might have made the subcontractor a party to the action, it would not make the subcontractor a party to the action since the owner brought the action solely against the general contractor. As authority to sustain its statement that the owner could have brought an action against the subcontractor, the court cites the case of Brown v. Bowers Construction Co., 236 N.C. 462, 73 S.E. 147.

This right is given in a few states on the theory that the subcontract is entered into for the benefit of the owner. Nevertheless, the court's statement should be used with caution, as the law in most states is to the effect that there is no contractual relation between the owner and the subcontractor, and neither party has any right of action against the other.

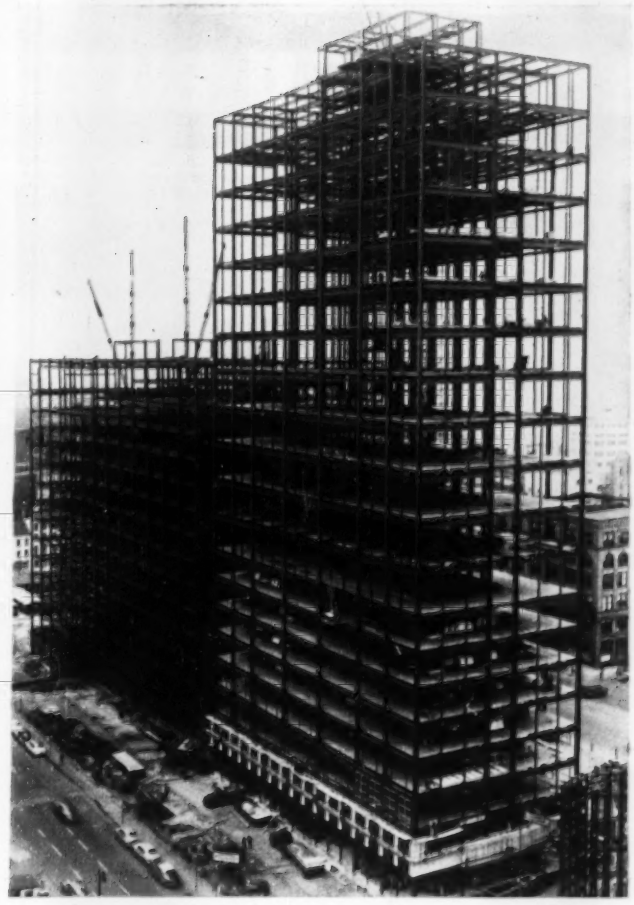
(1) Gaither Corporation v. Skinner, et al., 238 N.C. 254, 77 S.E. 2d 659, Supreme Court of North Carolina, Sept. 23, 1953.

Liquidated damages for delayed performance

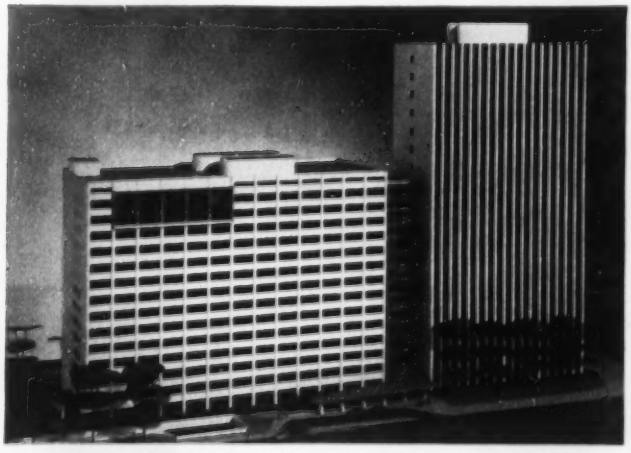
A construction contract provided that if completion of the building was delayed by the acts of the owner, the time of performance would be extended. The contract, however, stipulated that all claims for extensions of time in which to perform must be made in writing. Under such circumstances, the court held that an oral demand for an extension of time in which to perform was insufficient, and in the absence of a written demand for such extension, the contractor could not avoid liability for liquidated damages on the ground that delay in completing the work was caused by the owner.

"Such provision is regarded by the

(*Continued on page 78*)



An important step in Detroit's big civic-development program, this $22½-million structure will house 36 courts in the 20-story Courts Unit, providing 455,248 square feet of floor space in the 14-story Office Unit. *Owner:* Detroit-Wayne (County) Joint Building Authority. *Architects and Engineers:* Harley, Ellington and Day, Inc. *General Contractor:* Bryant & Detwiler Co. *Steel Fabrication and Erection:* Bethlehem Steel Co.



Model of the two units, joined by a 14-story, 38 x 40-ft glassed-in link, which will furnish space for 4,000 municipal and county workers. The building is located between Woodward, Larned, Randolph and Jefferson Avenues, in downtown Detroit.

Steel for Detroit's City-County Building Erected in 5½ Months

The people of Detroit are going to have their attractive new City-County Building a lot sooner than they expected, thanks to a fast job of steel erection.

A number of unusual engineering problems were involved in erecting the 8,200 tons of structural steel. For instance, the plans called for three-story tiers and columns which take considerable time to erect. Another difficulty was the complete absence of storage space at the mid-city site. Furthermore, the use of crawler cranes was complicated by congested basement areas, as well as underground piping, caisson foundations and elevator-pit openings.

Bethlehem engineers devised various measures to cope with these problems. The two units were erected separately, with closely-coordinated use of three big guy derricks. To compensate for the absence of storage space, Bethlehem set up storage yards a mile from the erection site. The steel was trucked directly to the derricks, right over shored sections of the basement area. Excessive congestion on the floor area around the derricks due to the three-story tiers was avoided by providing additional installments of columns and spandrel beams. These were then erected before any interior beams were brought to the floor.

Thanks to careful planning—and with an assist from favorable weather—the steelwork was completed in just 5½ months, far ahead of schedule.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Read This—BEFORE YOU BUY A

New Cost-Reducing Features Keep FLEX-PLANE Detroit Special Best Finishing Machine Buy

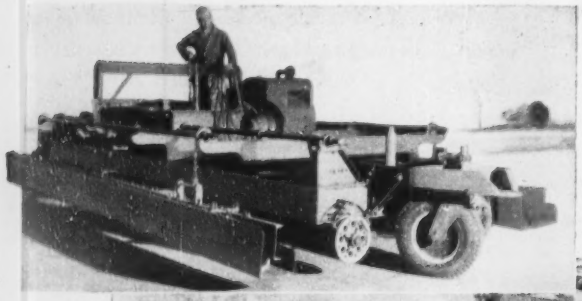
If you get all the facts before you buy a finishing machine — you'll buy a Flex-Plane Detroit Special.

Here are a few of the reasons why. It's the most portable machine to ever take the forms. It requires no extra labor, cranes or large trucks to be moved from job to job. No "extra hands" needed and no crew waiting.

It's the most adjustable machine ever assembled. The **Two-in-One** working width means just that. Other equipment available today permits, at the most, only five foot range in adjustability. Flex-Plane's super **Two-in-One** adjustability more than doubles this range of working widths.

It's custom-built to your particular needs. You give us your requirements and we'll build a Special that will fit them. A tough, rugged worker that will stand up under continuous use with a minimum of maintenance.

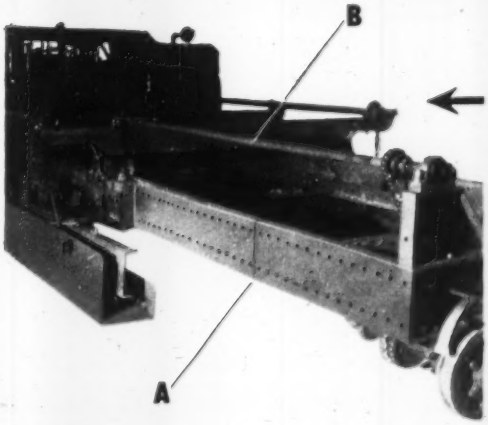
But get all the facts. Get the new 16-page documented booklet! Hear the story from other contractors! Watch it work! Compare it — and you'll join the ever increasing number of contractors who have found the answer to all finishing problems — **the amazing Flex-Plane Detroit Special.**



SELF-POWERED the Detroit Special will maneuver under its own power to position itself into the most advantageous hitching position.

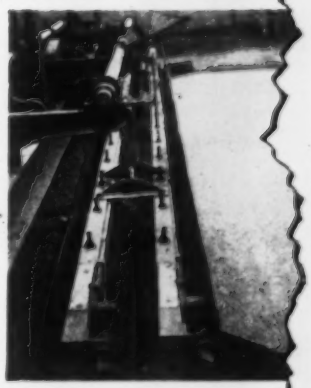
POWER PLUS! The Detroit Special's heavy duty transmission enables the machine to work harsh, low slump concrete up to 35 feet in width with ease. Frequently does double duty as a spreader.

FINISHER



UNMATCHED ADJUSTABILITY is possible because of extra length frame and drive shaft. Even when machine is extended to maximum (Arrows A & B) there remains a tremendous overlap which gives the Detroit Special unmatched stability in the extended position. You don't sacrifice rigidity or finish quality to have extra width.

SUPER SCREEDS mounted on the standard Detroit Special have 12" bottoms — a total of 24" of screeding surface —widest in the field. For even finer screeding the extra-wide Flex-Plane Compound Screed (right) with a 20" bottom, is easily worked by the Detroit Special.



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2800 Thomas Road
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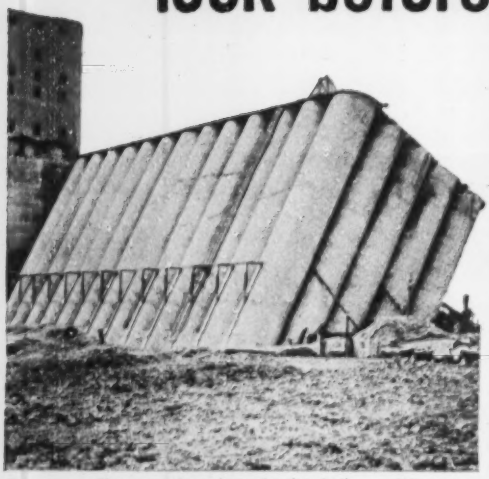

Transcona Elevator, Canadian Pacific Railway, Winnepeg, Canada, which tipped 27°—righted by the Foundation Company Ltd. of Canada.

An elevator tips—a bridge sags—a building settles—a dam goes out—costly and serious mistakes in construction work. That's why it pays to make test borings before designing foundations. And, when you investigate subsoil conditions, you want the best—ACKER! For, Acker makes a complete line of low-cost, easy-to-operate soil sampling equipment—from hand to power driven tools.

Remember, too, Acker's 33 years of experience in designing and building soil sampling and core drilling equipment ONLY, is your guarantee of dependable, satisfactory operation.

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SHOWS HOW

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courts as specifying a condition precedent to any right of the contractor to be excused for delay due to the fault of the owner, and where no demand for such extension of time is made, the contractor is not in a position to assert that the owner caused a delay in completion." The court cites numerous cases to sustain this proposition of law.

"These cases hold that a provision of this kind is a condition precedent, compliance with which must be shown, because it must be assumed that the parties in inserting such provision attached both value and importance to its precise terms. Where the contract stipulates that there must be a written application or demand for extension of time, an oral demand is insufficient." Numerous cases are cited.

The court in its opinion stated further: "Where the contractor abandons the work after the time fixed for completion, the clause providing for liquidated damages applies from the time fixed for completion until the work is abandoned and for a further period of time, reasonably necessary to complete the job. Of course the owner may not increase his recovery either by unreasonable delay in taking over the job, or by failing to complete it with diligence and dispatch. School District No. 3 of Ford County v. U. S. Fidelity & Guaranty Co., 96 Kan. 499, 152 P. 668."[1]

[1] Austin-Griffith, Inc. v. Goldberg et al., 79 SE. 2d 447, Supreme Court of South Carolina, Dec. 21, 1953.

Conflict between laws and contract provisions

The specifications that were included in the contract for the rehabilitation of multiple dwellings for the city of New York gave the contractor the option to use either plaster board or plaster over lath in the bathrooms of the buildings. The contract contained certain general provisions to the effect that the contractor would comply with the rules and regulations of the state affecting work of this character.

The contractor decided to use plaster board to do this part of the work. Subsequently the Department of Housing and Buildings ruled that the Multiple Dwelling Law required the use of plaster over lath, a more expensive method of doing the work. As a result the city officials in charge of the work delivered to the contractor a change order, duly executed, modifying the specifications and agreeing to pay the contractor as extra work the additional expense incurred using

plaster over lath instead of plaster board.

The extra work order was subject to the approval of the comptroller and to all the terms and conditions of the contract. The comptroller refused to approve of payment for the increased cost of the work on the ground that the general provisions of the contract called for compliance with the requirements of the Multiple Dwelling Law, and that this required the contractor to use lath and plaster even though the specifications gave the contractor the option to do the work by a method that violated the law.

The contractor brought an action to recover the amount provided for in the extra work order. The trial court sustained the contention of the comptroller and dismissed the action. This judgment, however, was reversed by the appellate court,[1] that court holding that the contractor was entitled to recover the increased cost of the work caused by the change order. Hence it directed a new trial.

The appellate court in its opinion stated: "The city prepared the plans and specifications and asked for competitive bidding on the basis thereof. It could not be expected that the bidders would examine the various laws and building codes as to each item specified to see if the codes required some different method of construction. Such procedure would make the bidders' interpretation of the law rather than the specifications controlling. It would make the specifications so indefinite and uncertain as to destroy the validity of any contract awarded pursuant thereto (Brooklyn Ash Removal Company v. O'Brien, 238 App. Div. 647). We find that the provisions of the contract did not eliminate the right to extra charges if a change order was issued requiring more expensive construction, even though the change was due to some legal requirement overlooked in the specifications."

(1) Green Construction Company v. City of New York, 128 N.Y.S. 2d 715, Appellate Division, First Dept., N.Y., March 30, 1954.

When no limit is set on time for performance

"Where no definite time is stated for the performance of a contract, the presumption is that the parties intended that performance would be had within a reasonable time. What is a reasonable time is a question of fact in each case, to be decided by the jury. Restatement of Contracts, Section 32, Illustration 4."[1]

(1) Wolf v. Arant, 77 S.E. 2d 116, Court of Appeals of Georgia, July 14, 1953.

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

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J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Mass., Bedford**—TRAINING CENTER FACILITIES—B.A. 6/11—U. S. Eng., 857 Commonwealth Ave., Boston, constr. air force reserve training center facilities, Hanscom Air Force Base, ENG-19-016-54-106, $1,000,000-$1,200,000. Plans deposit $20 refundable, Edwin Steffian, 11 Beacon St., Boston, archt. CD 5/12.

† **Mass., Falmouth**—READINESS HANGAR—B.A. On Or About 6/25—U. S. Eng., 857 Commonwealth Ave., Boston, Zone 15, readiness hangar with shops and maintenance hangar with shops, Otis Air Force Base, Eng. 19-016-54-115, $750,000-$1,000,000. CD 11/21/52.

BIDS ASKED—BUILDINGS

▲ **Me., Portland**—SERVICE BLDG. AND WAREHOUSE—B.A. 6/8—Central Main Power Co., 9 Green St., Augusta, 2 story, 131x140 ft. office, 1 story, 148x209 ft. stock room, 1 story, 60x120 ft. garage, steel, brick piles, $1,000,000, Alonzo J. Harriman, Inc., 292 Court St., Auburn, archt.

Conn., New Haven—SCHOOL—B.A. 6/9—City, Bd. Educ., 169 Church St., renovate Sheridan High School, 203-207 Fountain St. $520,000. Hill & Harrigan, 909 Whalley Ave., New Haven, Conn., mech. engrs. Pederson & Tilney, 111 Whitney Ave., and Harrison Baldwin, 57 Fountain St., New Haven, archts. CD 12/23.

▲ **Mass., Lowell**—HOUSING—B.A. 6/11—Lowell Housing Auth., 18 Market St., 156 housing units, South Common Village, Gorham St., Proj. PHA 1-3, $1,500,000. Plans deposit $100 refundable, Krokyn & Browne, 184 Boylston St., Boston, archts. Bids 5/11 rejected. CD 5/17, under LB.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Petricca Constr. Co., 534 West St., Pittsfield, Mass., LB $523,130, est. $450,000. hy. and bridge work, New Ashford.

▲ **MASSACHUSETTS**—Commonwealth of Mass., Metropolitan Dist. Comn., Parks Div., 20 Somerset St., Boston,
Coleman Bros. Corp., 40 Central St., Boston, Mass. LB $1,672,199, est. $1,350,000. Proj. 847 grade separation Western Ave. and Cambridge St., on Soldiers Field Rd., Brighton. Bids May 20. CD 5/4.

Charles Capone Constr. Co., Inc., 856A Providence Hy., Dedham, Mass. LB $350,205, est. $390,000. hy. reconstr. Sect. of Rte. 140, Wrentham. Bids May 18. CD 5/5.

Connecticut Valley Constr. Co., Inc., 15 Union St., Springfield, Mass. LB $203,820, est. $200,000. water pipe lines, WEST SPRINGFIELD, MASS. Town Water Dpt., 126 Park St., West Springfield, Mass. Bids May 24. CD 5/19.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. J., Trenton—B.A. 6/7—Ewing Lawrence Sewerage Auth., 146 W. State St., 12,645 ft. 6- to 10-in gravity sewer line. Ewing and Lawrence Twps. Plans deposit $25. Buck, Seifert & Jost, 112 E. 19 St., New York 3, N. Y., engrs.

New Jersey—TOLL PLAZAS—B.A. 6/10—New Jersey Hy. Auth., State Dpt. Office Bldg., 1035 Parkway Ave., Trenton.
Contract No. 151, Sections 2 and 4, Garden State Parkway grading, drainage, paving and structures for Toll Plazas "P-1", "P-2", city of Clifton, Passaic Co.; "E" (No. 11; "W-1" and "W-2" (No. 1-B) town of Bloomfield, Essex Co.; "I-1" and "I-2" (No. 2-A) town of Irvington, Essex Co. Plans deposit $10.

BIDS ASKED—BUILDINGS

▲ **N. Y., Irvington**—SCHOOL—B.A. 6/6—Bd. Educ., Main St., elementary school, $974,000; high school improvs., $301,000. Knappe & Johnson, 390 E. 150 St., New York, Zone 55, archts. CD 12/4.

† **D. C., Wash.**—BUILDING ALTERATIONS—B.A. 6/9—Dist. P. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Building No. 154 alterations at U. S. Naval Gun Factory, NOY 83657. Plans deposit $10.

† **Md., Annapolis**—B.O.Q. BLDG.—B.A. 6/10—Officer in Charge of Constr., U. S. Naval Academy, Annapolis, rehabilitation Bldg. No. 2 B.O.Q., U. S. Naval Academy, NOY 79391, Spec. 39744. Plans deposit $10. CD 11/17/47.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany,
Corbetta Contg. Co., Inc., 220 E. 42 St., New York, N. Y. LB $15,416,893, est. $17,921,000, constr. 2.94 mi. sect. State Thruway's Southern Westchester connection along Central Park Ave. in Yonkres, Westchester Co.;
Tuckahoe Constr. Co., Inc., 116 Columbus Ave., Tuckahoe, N. Y., LB $1,024,020, est. $1,084,000, paving twin 36-ft. concrete traffic arteries, lighting, fencing and misc. landscaping work 0.95 mi. sect. Major Deegan Expressway Exten. in vicinity of Van Cortlandt Park, Bronx Co.;
The Tomlinson Constr. Co., Ltd., Rotterdam Junction, N. Y. LB $4,250,001, est. $4,948,000, constr. work of 13.32 mi. on Grand Island portion of New York State Thruway's Niagara Sect. between Buffalo and Niagara Falls, Erie Co.;
Klevens Corp., 3 Federal St., Yonkers, N. Y., LB $1,466,230, est. $1,714,000, grading, drainage, paving work and constr. five span 1,900 ft. steel, concrete viaduct to carry Cross Bronx Expressway over Bronx River Parkway and Delaware Ave. 2.32 mi., Bronx Co.;
Maxim Kranz & L. S. Martin, Troy, N. Y., LB $601,170, est. $734,000, reconstr. with 24 ft. c. conc. 3.94 mi. Rte. 14 from Holbrook Rd. just north of State Thruway and extending northward to Ontario-Wayne Co. line, Ontario Co.;
Warren Bros. Roads Co., 309 Basin St., Syracuse, N. Y. LB $176,576, est. $187,000, rough grading, drainage, misc. work necessary to prepare site for future bldg. of restaurant and gas station facilities (Junius Ponds) on State Thruway approx. 5 mi. northwest of Waterloo in northern Seneca Co. Bids May 20. CD 4/28 and 5/10.
▲ **Construction Service Company**, Lincoln Blvd., Bound Brook, N. J., CA, $1,095,399, Contract "A", structural work;
J. F. Chapman & Sons, Inc., 1303 N. Broad St., Hillside, N. J., CA, $584,770, Contract "B", grading, for grade crossing elimination through Dunellen & Plainfield, NEW JERSEY. The Central R. R. of New Jersey, S. L. Mapes, ch. engr., Jersey City Terminal, foot of Johnston Ave., Jersey City, N. J. Bids Apr. 15. CD 3/22.
† **Tandy & Allen Constr. Co., Inc.**, 280 Hackensack Ave., Hackensack, N. J., CA, $347,000, anti-aircraft facilities at Crawford Corners, Serial No. ENG-30-075-54-233. HOLMDEL, N. J. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Apr. 15. CD 3/24.
† **Joseph Halpern**, 33-49 Vernon Blvd., Long Island City, N. Y., CA $820,609, anti-aircraft facilities, Serial No. ENG-30-075-54-225, SOUTH AMBOY and PLAINFIELD, N. J. U. S. Eng., 30 Lafayette St., New York, 13, N. Y. Bids Apr. 20. CD 3/24.
PENNSYLVANIA—State Hy. Dpt., 506 North Office Bldg., Harrisburg,
F. D. Kessler, Inc., Northumberland, Pa., CA $972,371. constr. 30,216 ft. c. conc. pavement variable in width, two I-beam bridges, T. R. 11, Mahoning, Cooper and Montour Twps., Montour and Columbia Counties. Bids May 7, awarded May 19. CD 5/11, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Pinewood Homes**, c/o Albert B. Meklenburg Organization, Inc., 1038 Northern Blvd., Roslyn, N. Y. Owner Builds. $1,800,000. 70 HOUSES, tract on Mason Rd. and Pinewood Dr., FLOWER HILL, N. Y.
▲ **Stock Constr. & Co.**, 3842 Grand Central Terminal, New York 17, N. Y., LB, $7,712,000, apparent low bidder, Items 1 through 14, base bid, for animal disease LABORATORY, Plum Island, Serial No. ENG-30-075-54-99, FORT TERRY, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids May 20. CD 4/2.
▲ **Wolf Hill Estates Homes**, c/o Albert B. Meklenburg Organization, Inc., 1038 Northern Blvd., Roslyn, N. Y. Owner Builds. $1,000,000. 55 HOUSES, 58-acre tract, Wolf Hill Rd., south of Jericho Turnpike, HUNTINGTON, N. Y.
Hudson View Park Homes, c/o Brown-Solomon & Co., 1006 Brown St., Peekskill, N. Y. Owner Builds. $800,000. 60 HOUSES, Crescent Court off Maple Ave. PEEKSKILL, N. Y.
▲ **Elmwood Homes**, c/o A. H. Salkowitz, archt., 37-60 82 St., Jackson Heights, N. Y. Owner Builds. $1,000,000. 35 HOUSES tract at 146 St. and 14 Ave., WHITESTONE, N. Y.
▲ **Mahony-Troast Constr. Co.**, 790 Bloomfield Ave., Clifton, N. J., CA. Est. $1,500,000, STUDENT NURSES HOME, PASSAIC, N. J., St. Mary's Hospital, 211 Pennington Ave., Passaic, N. J. Fanning & Shaw, 49 Ward St., Paterson, N. J., archt.
▲ **Lloyd's Development & Constr., Inc.**, 520 Pleasure Rd., Lancaster, Pa., Separate Contracts. $1,200,000. RESIDENTIAL DEVELOPMENT, Rte. 622, DUGLERSVILLE, PA.
D. D. Davis Constr. Co., 5234 Glenwood Ave., Youngstown, O., CA, $850,000, 2 story T-shaped NOVITIATE bldg., 3 story INFIRMARY with 1-story KITCHEN at Villa Maria Convent, NEW BEDFORD, PA. Sisters of Holy Humility of Mary Mother Mary Lorita, mother superior, Villa Maria Convent, New Bedford, Pa. Awarded May 14.
▲ **Owner**, c/o Fidelity Bond & Mortgage Co., Lincoln Liberty Bldg., Phila., Pa., Separate Contracts. $12,000,000. RESIDENTIAL DEVELOPMENT, Bustleton and Tustin Aves., PHILA., PA.
▲ **Penrose Co.**, c/o Thomas J. Farrell, Riverview Rd., Drexel Hill, Pa., Separate Contracts, $2,500,000. RESIDENTIAL DEVELOPMENT, West Goshen Twp., WEST CHESTER, PA.
▲ **Cafritz Const. Co.**, 1404 K St. N.W., Wash., D. C., Owner Builds, $1,512,000, 21 APARTMENT bldg., incl. 252-units, Mississipoi Ave., Savannah St., 21 St. and 22 Sts. S.E., WASH., D. C. Leroy Werner, 1404 K St. N.W., archt.
Segreti Constr. Co., Inc., 5009 Wisconsin Ave. N.W., Wash., D. C., LB, $369,210, 2 story, masonry, concrete, steel auto SHOWROOM, SHOP and GAS STATION, 2625 Firth Sterling Ave. S.E., WASH.; D. C. Frank Small Jr., Inc., 215 Pennsylvania Ave. S.W., Wash., D. C. Walton & Madden, 3510 Rhode Island Ave., Mt. Rainier, Md., archts. Bids May 18.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **La., Shreveport**—PUMP STATION, etc.—B.A. On Or About 6/18—U. S. Eng., P.O. Box 867, Little Rock, Ark., Job No. Barksdale Air Force Base 52-ACRP-AF pump station and reservoir, Barksdale Air Force Base, ENG-03-050-54-18.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Stanley W. Newman, Inc.**, 1505 Washington Ave. South, Mobile, Ala., CA, $238,443, base operation bldg., control tower, parachute bldg., dinghy shop, with drying tower, 2 hydrogen and oxygen storage bldg., EGLIN AIR FORCE BASE, FLA. U. S. Eng., P.O. Box 1169, Mobile 7, Ala. Bids May 11. CD 4/28.
▲ **Whittle Constr. Co.**, 3102 Kings Row, Dallas, Tex., CA $1,730,000, est. $2,000,000, 13,000 ft. sewage disposal tunnel, 6 ft. diam., 60 ft. deep to carry sewage to main Nashville treatment plant, incl. interceptor chambers and tide gates where outfall sewers connect;
Own Forces. $90,000. repairing sewerage sys. at Sevier Park, NASHVILLE, TENN. City, Court House-City Hall Bldg., Nashville, Tenn. Bids May 11, awarded May 19. CD 4/14.

(Continued on page 82)

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over
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ENR Engineering News-Record
CD Engineering News-Record Construction Daily

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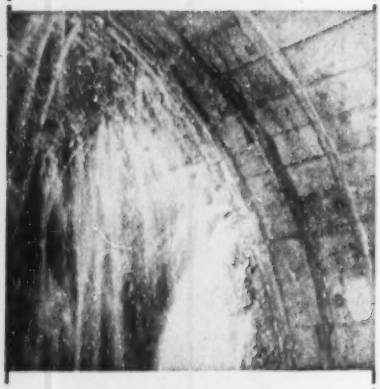

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WASHINGTON, D. C.

(Continued from page 80)

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **E. L. Daniels**, 1511 N. Quincey St., Arlington, Va. CA $1,191,873, McLean HIGH SCHOOL, FAIRFAX, VA. Fairfax Bd. Educ., Fairfax, Va. Bids May 20. CD 4/29.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

† Ill., Chicago—STORAGE FACILITIES—B.A. 6/9—U. S. Eng., 475 Merchandise Mart, Zone 54, addnl-jet fuel storage facilities at O'Hare Field, Serial No. ENG-11-032-54-53. CD 7/18/51.

▲ O., Cleveland—B.A. 6/11—City, Dept. P. Utilities, Emil J. Crown, dir., City Hall Zone 14, 24,500 lin. ft. 30 in. concrete or steel water main in E. 71 St. from Harvard Ave. South. $1,400,000. Plans deposit $75. George W. Hamlin, c/o owner, engr. CD 3/10/53.

† Illinois—B.A. 6/21—U. S. Eng., 420 Locust St., St. Louis 2, Mo., stone dike, spur levee and bank protection East Cape Girardeau and Clear Creek Drainage District, Proj. Item IV, Alexander Co., CIVENG-23-065-54-113. CD 12/8/52.

BIDS ASKED—BUILDINGS

▲ Ill., West Chicago—SEMINARY—B.A. 6/14—Franciscan Fathers, West Chicago, 2 story, part bsmnt., Christ the King Theological Seminary, $1,000,000. J. P. Bazzini, 64 W. Randolph St., Chicago, Zone 1, engr. Thos J. Higgins, 228 N. La Salle St., Chicago, Zone 1, archt. CD 1/15.

Ind., Indianapolis—PLANT—B.A. About 6/15—Peerless Pump Div., Food Machinery & Chemical Corp., 21 and Northwestern Ave., plant addns. $500,000 or more.

Wis., Madison—CLINIC—B.A. 6/17—Jackson Clinic, West Main and South Henry Sts., clinic bldg., $475,000. Ellerbe & Co., E. 505 First National Bldg., St. Paul, Minn., archts.

▲ Wis., Wauwatosa—HIGH SCHOOL—B.A. 7/1—Bd. Educ., 1732 Wauwatosa Ave., Milwaukee, Zone 13, Longfellow Junior High School, $2,500,000. Ebling, Plunkett & Keymar, 1220 N. Milwaukee St., Milwaukee, archts. CD 1/20/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ OHIO—State Hy. Dpt., Columbus,
Oyler Bros., Inc., 1324 Second St. S. W., Canton, O., CA, $808,249, est. $808,800, Type T-35 on B-70 and structures 1.991 mi. S.R. 5, Sects (5.39-6.89), F-198 (4), Braceville and Warren Twps., Trumbull Co.;
Heffner Constr. Co., 509 N. Main St., Celina, O., CA, $1,903,834, est. $1,995,900, Type T-71 and structures, 8.782 mi. U. S. R. 25, Sects. 17.40, 0.00, Richland Twp. Orange and Union Twps., Allen and Hancock Counties;
George B. Herring & Son, Inc., 30 Junction St., Mansfield, O., CA, $808,739, est. $913,100, Part No. 1, Type T-71 and structure, 3.096 mi.; Part No. 2, Type T-35 on B-119, 0.389 mi., Newton Twp. U. S. R. 22, Sect. 0.28, S. R. 345, Sect. 2.34, (Parts Nos. 1 and 2), Muskingum Co. Grand total $3,520,822. Bids May 11. CD 5/19, under LB.

OHIO—State Hy. Dpt., Columbus,
rejected bids May 11, Type T-35, 6.813 mi. S. R. 214 Sects. (0.00-0.05), Pease and Pultney Twps., Belmont Co., LB, $192,206; Type T-35, Alt. A or B, 1.202 mi. U. S. R. 224, Sects (20.27-20.47), Guilford and Wadsworth Twps., Medina Co., LB, $189,543 Alt. A, $171,624 Alt. B. CD 5/19, under LB.

▲ WISCONSIN—State Hy. Comn., State Office Bldg., Madison,
Arthur J. Pagel, Almond, Wis., LB, $118,786, Contract 2, 4.965 mi. Project T 0113 (5), Waupaca Co.;
Koshak Brothers, Park Falls, Wis., LB, $82,833, Contract 1, 2.714 mi. Proj. T 099 (3), Florence Co.;
R. R. Birdsall & Sons Co., 1025 12 St., Racine, Wis., LB, $267,948, 0.988 mi Proj. U 6003 (1), Racine Co.;
N. M. Isabella, Inc., 714 Market Pl., Madison, Wis., LB, $81,302, Contract 1, 0.551 mi. Proj. T 019-3 (9), Waupaca Co.;
Rein & Schultz, Inc., 119 E. Washington Ave., Madison, Wis., LB, $224,141, 11.767 mi. Contract 1, Proj. T 04-1 (11), T 04-1 (14) T 063-1 (3) and T 3743 (1), T 3742 (1), Walworth Co.;
The White Constr. Co., 710 N. Plankinton Ave., Milwaukee, Wis., LB, $84,219, 4.15 mi. Proj. T 013-1 (5), Kenosha Co.;
J. P. Humphries, Inc., 3269 N. 48 St., Milwaukee, Wis., LB, $220,406, 9.998 mi. Contract 1, Proj. T 034-1 (4), T 034 (2), T 034-1 (3) and T 0352 (1), Milwaukee and Waukesha Counties;
Reliance Constr. Co., Sheboygan, Wis., LB, $70,815. Contract 1, b. conc. 1.228 mi. Proj. T5301 (1) and T 6501 (1), Manitowoc Co.;
H. Turner & Son, Boscobel, Wis., LB, $139,770, Contract 1, 5.21 mi. Proj. T 020 -2 (7) Shawano Co.;
Ashworth & Sons Co., St. Louis Park, Minn., LB, $81,544. Contract 1 6.7 mi. Proj. T 0283 (7), Price Co.;
Otto Wiesner, Inc. & Otto Wiesner, Superior, Wis., LB, $126,773, Contract 1, 11.8 mi. Proj. T 0812 (1) Vilas Co.;
Ryan Bros., Janesville, Wis., LB, $133,993, Contract 1, 1.469 mi. Proj. T 012-1 (10) and T 012-1 (11) Lafayette Co. Bids May 18. CD 4/30.
R. Beaudoin & Son, 7227 W. Maple Terrace, Milwaukee 13, Wis. CA, $94,079, c. conc. paving W. Colonial Drive;
Badger Constr. Co., 229 E. Wisconsin Ave., Milwaukee 2, Wis. CA, $121,988 asph. surf. S. Kinnickinnic Ave., MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids May 14, awarded May 18.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Procon Co.**, Des Plaines, Ill., CA. Approx. $10,000,000. 10,000 bbl. per day PLATFORMING CATALYTIC REFORMING UNIT at refinery, CLEVELAND, O. Gulf Refining Co., 3222 Beckman St., Cincinnati, O.

▲ **Bleznak Bros.**, 814 N. Broad St., Woodbury, N. J. CA $4,889,000, construct, manage, finance HOUSING, 103 bldgs. to house airmen and officers, 24 garage compounds, 21 fenced in play areas, to house 500-families, Lockbourne Air Force Base, COLUMBUS, O. U. S. Eng., 237 Fourth Ave., Huntington 18, W. Va. Bids Apr. 22, awarded May 11. CD 4/27, under LB.

George Dysart, 666 Oakland Park St., Columbus, O., CA Approx. $700,000. 100x125 ft. stucco, Spanish architecture RESTAURANT along Olentangy River Rd. between Fifth and King Aves., COLUMBUS, O. The Jai Lai, Inc., N. High St. at Poplar St., Columbus, O. Milosevich & Trautwein, 3391 N. High St., Columbus, O., archts.

George B. Payne Constr. Co., Painesville, O., CA Approx. $300,000. DORMITORY for 64 students, PAINESVILLE, O. Lake Erie College, Painesville, O.

James I. Barnes Constr. Co., 6 Bechtle Ave., Springfield, O., CA $329,350. 3 story brick, concrete, steel men's DORMITORY, YELLOW SPRINGS, O. Antioch College, Yellow Springs, O.

▲ **George Sollitt Constr. Co.**, 109 N. Dearborn St., Chicago 2, Ill., CA, $4,000,000, 22 story APARTMENT, De Witt Pl. and Chestnut St., CHICAGO, ILL. Aaron B. Weiner, 33 N. La Salle St., Chicago, Ill. Hirschfield & Pawlan, 111 W. Monroe St., Chicago, Zone 3, archt. Awarded May 19.

▲ **Herlihy Mid-Continent Co.**, 135 S. La Salle St., Chicago 3, Ill., LB, $1,026,782 PARKING GARAGE, State St. between Harrison and Congress Sts., CHICAGO, ILL. City, City Hall, Chicago, Ill. Bids May 18. CD 5/5.

▲ **Raymond Platt**, 4038 Overhill Dr., Norridge, Ill., Own Forces, $5,000,000, 300-HOMES and SHOPPING CENTER 90-acre development on Route 31 X Northwest Highway, near CRYSTAL LAKE, ILL. R. W. Alf, 29156 Peterson Rd., Chicago, Ill., archt.

▲ **E. A. Long & Co.**, P. O. Box 287, Rockford, Ill., Own Forces, $1,200,000, 100 HOMES, ROCKFORD, ILL.

▲ **Siesel Constr. Co.**, 514 East Ogden Ave., Milwaukee, Wis., LB, $2,083,000. LIBRARY addn., alterations, MILWAUKEE, WIS. Bd. Library Trustees, 814 W. Wisconsin Ave., Milwaukee, Wis. Bids May 30. CD 4/20.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Minn., Spicer—B.A. 6/9—Village, V. E. Solmonson, clk., 16,509 lin. ft. 8 in. vitr. clay sanitary sewers, 8,000 lin. ft. 6 in. vitr. clay sanitary sewer, 1,900 lin. ft. 4 in. sewer force main Class 150, 2,895 lin. ft. 6 in. sewer force main Class 150, 62 sanitary sewer manholes, 2,050 sq. yd. black top paving replaced, 3,100 sq. yd. 3 in. grav. street replaced, 3 sewage lift stations, sewage treatment plant, $225,000. Plans deposit $25. H. A. Davis, Rte. 2, Rosemount, engr. CD 5/18, under LB.

† **Texas**—B.A. 6/10—Soil Conservation Service, First Natl. Bank Bldg., Temple (171-54) constr. floodwater retarding structures on Calaveras Creek Watershed of San Antonio Watershed, approx. 13 mi. north of Elmendorf, Bexar Co. CD 9/4, under Tex., San Antonio.

† **Tex., Abilene**—BACHELOR OFFICERS QUARTERS—B.A. 6/17—U. S. Eng., 100 W. Vickery St., Fort Worth, bachelor officers quarters, Abilene Air Force Base, Inv. No. ENG-41-443-54-70. CD 12/10/52.

† **Kan., Topeka**—APRON ELECTRICAL SYSTEM—B.A. On Or About 6/25—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., constr. apron electrical sys. FY-53 Phase II, Forbes Air Force Base, ENG-23-028-54-79. CD 11/21/51.

Tex., Long Mott—B.A. 6/28—West Side Calhoun County Navigation Dist., T. A. McDonald, chn. Bd. Navigation & Canal Comrs., Long Mott, Contr. 1, 16 mi. barge canal turning basin; barge docking facilities, $100,000-$250,000; Contr. 2, some phases of canal work, $100,000; Contr. 3, some phases canal work, $75,000. Lockwood & Andrews, 905 Union Natl. Bank Bldg., Houston, engrs. CD 512, under LB.

▲† **Tex., Lackland Air Force Base**—HOSPITAL—B.A. 9/16—U. S. Eng., Box 1229, Galveston, revised plans for 500-1,000 bed, 9 story 335,000 sq. ft. rein.-con. hospital, 32,000 sq. yd. paved service roads and parking areas, boiler house, Inv. No. ENG-41-243-54-85. $5,000,000. CD 5/27.

BIDS ASKED—BUILDINGS

† **Tex., El Paso**—SHOP—B.A. 6/11—U. S. Eng., Box 1538, Albuquerque, N. M., artillery and GM maintenance shop, Fort Bliss, Serial No. ENG-29-005-54-119. $850,000-$1,750,000. CD 5/12.

Kan., Coffeyville—ELECTRIC PLANT—B.A. 6/22—City, Joseph F. Waller, clk., furnishing, erecting 18,000 sq. ft. surface condenser at municipal electric plant. Lutz & May, 819 Finance Bldg., Kansas City 6, Mo., consult. engrs. CD 3/3.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

City, Mrs. A. Finkle, clk., City Hall, Minneapolis, Minn. Own Forces. $200,000. furnish, install storm drains, 52 Ave. North, Lyndale to Irving Aves.; 51st Ave. North, Lyndale to Girard Aves.; Girard Ave.; Lyndale Ave. North, 50 Ave. North to 42 Ave. N., MINNEAPOLIS, MINN. H. Erickson, Minneapolis, Minn., city engr. W. A. Ostrem, asst. engr. in charge of sewers. CD 2/2.

City, Mrs. A. Finkle, clk., City Hall, Minneapolis, Minn. Own. Forces. $222,500. furnish, install storm drains 12- to 84-in. area enclosed by Shoreview Ave. 33 Ave. South, 54 St., 57 St., MINNEAPOLIS, MINN. CD 1/27.

† Nelson Electric Mfg. Co., 217 N. Detroit St., Tulsa, Okla., LB $127,955, Schedule A for main control boards, motor-generator sets, inverter set and relays for Gavin Point Reservoir Proj., near Yankton, Inv. 25-066-54-128, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 18. CD 5/10.

▲† Korshoj Constr. Co., Blair, Neb., CA $1,021,977, multi-purpose docks, Lincoln Air Force Base, Inv. 25-066-54-64, LINCOLN, NEB. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids May 18. CD 5/19, under LB.

KANSAS—State Hy. Comn., Hays,

Brown Brothers Constr., Manhattan, Kan. CA $104,870. grading, detour surf. 6.111 mi., and 0.464 mi. Proj. 59-2 F 067-2 (4) Parts I and II, Anderson Co.;

Freeto Constr. Co., Inc., Pittsburg, Kan. CA $134,584. single asph. surf. tr. (detour) 9.105 mi., Bridge 166-11-12.2, Sta. 650 plus 15, two 14x12 ft. 42 ft. rein.-con. Proj. 166-11 F 010-2 (4), Cherokee Co. Bids May 18. CD 5/11.

TEXAS—State Hy. Comn., Austin,

Ernest Loyd, P.O. Box 1120, Fort Worth, Tex., LB $259,054, widen structures and roadway approaches 0.944 mi. Hy. U.S. 79, Proj. F 494 (6), etc., Milam Co. Bids May 18. CD 5/5.

▲ TEXAS—State Hy. Comn., Austin,

Austin Bridge Co., P.O. Box 1590, Dallas, Tex., LB $109,016, grading, structures, base and surf. 2.605 mi. Hy. FM 1515, 455, 1173, 1172, etc., Proj. S 1884 (1), etc. Denton Co.;

Bell, Braden, Barker & Gilvin, Inc., P.O. Box 2268, Amarillo, Tex., LB $68,143, grading, structures, base and surf. 5.239 mi. Hy. FM 2161, Proj. R 1884-2-1, Carson Co.;

Border Constr. Co., Zapata, Tex., LB $155,363, grading, structures, base, surf. 16.347 mi. Hy. FM 1217 Proj. C 556-6-3, Terrell Co.;

Bryan & Hoffman, P.O. Box 390, Plainview, Tex. LB $130,780, grading, structures base and surf. 11.778 mi. Hy. FM 97, Proj. S 1753 (1), etc., Floyd Co.;

R. C. Buckner, P.O. Box 609, Jacksonville, Tex., LB $91,554, grading, structures, base, surf. 6.694 mi. Hy. FM 2022, Proj. C 1875-2-1, Houston Co.;

Cage Bros., 6959 San Pedro St., San Antonio, Tex., LB $181,929, flexible base, two course surf. tr. 9.455 mi. Hy. SH 304, Gonzales Co.; LB $374,131, flexible base, b. conc. pavement and Park Rd. overpass 3.185 mi., U.S. 82, Proj. F 503 (7), etc., Lubbock Co.; LB $508,423, flexible base, b. conc. 10.888 mi. Hy. U.S. 80, Proj. FI 235 (20) and FGI 235 (21), Howard Co.; LB $98,279, foundation course, two course surf. tr. 7.248 mi. Hy. FM 1319, Proj. S 1508 (3), Bastrop Co.; LB $118,703, grading, structures, foundation course 2.919 mi. Hy. SH 158, Proj. C 405-1-4, Glasscock Co.;

Harry Campbell, Rte. 5, Box 68-A, Abilene, Tex., LB $137,859, grading, structures, base, surf. 12.001 mi. Hy. FM 1864, 880 and 675, Proj. C 1778-1-1, etc., Callahan and Shackelford Counties;

J. R. Canion, P.O. Box 756, Austin, Tex., LB $114,575, grading, structures, base, surf. 10.521 mi. Hy. FM 619, 1466, Proj. S 1104 (2), etc., Williamson Co.;

Cooper & Woodruff, 222 Mays Bldg., Amarillo, Tex., LB $236,312, grading, structures, base, surf. 31.523 mi. Hy. FM 1060, 119, 281 and 1598, Proj. S 1310 (2), etc. Moore, Sherman and Hutchinson Counties;

W. S. Crawford Co. & Adams Bros., 5350 Montrose Dr., Dallas, Tex., LB $196,578, grading, structures, base, surf. 6.043 mi. Hy. FM 118 and 2068, Proj. S 1836 (2) and S 1932 (1), Hunt Co.;

D. & H. Constr. Co., Box 13036 Walnut Hills Station, Dallas, Tex., LB $73,169, seal coat 80.017 mi. Hy. FM 174, 51, 422, etc., Proj. C 137-12-2, etc., Montague, Cooke, Baylor, Archer, Clay, Throckmorton and Young Counties;

Dew Constr. Co., Inc., P.O. Box 641, Tyler, Tex., LB $61,188, grading, structures, base, surf. 2.98 mi. Hy. FM 1567, Proj. S 1522 (3), Hopkins Co.;

Dodds & Wedegartner, Inc., San Benito, Tex., LB $72,-632, flexible base, two course surf. tr. 2.652 mi. Hy. FM 2098, Proj. S 1912 (1), Starr Co.;

E. W. Hable & Sons, P.O. Drawer 650, Corsicana, Tex. LB $104,861, flexible base, two course surf. tr. 1.685 mi. Hy. U.S. 96, Proj. C 65-4-27, Jasper Co.;

George Kies & R. B. Bowden, P.O. Box 5187, Austin, Tex. LB $135,975, seal coat 256.639 mi. Hy. U.S. 59, 181, 77, etc., Proj. C 87-1-21, C 88-1-16, etc., Jim Wells, Bee, San Patricio, Kleberg, Goliad Counties, etc.;

Ernest L. Mays, 3430 Minglewood St., Beaumont, Tex., LB $74,212, grading, structures, base and surf. 3.3 mi. Hy. FM 562, Proj. C 1022-1-6, Chambers Co.;

J. W. Moorman & Son, P.O. Box 270, Belton, Tex., LB $801,908, flexible base, hot mix b. conc. pavement and C. C. & S.F. Hy. overpass and underpass, 2.405 mi. Hy. U.S. 81, Proj. I 644 (11), Bell Co.;

Public Constr. Co., P.O. Box 380, Denton, Tex., LB $77,806, b. conc. 12.568 mi. Hy. U.S. 69, Proj. F 153 (4), Wood Co.;

Roland Schmidt, 1020 W. Pyron Ave., San Antonio, Tex. LB $218,777, flexible base, two course surf. tr.

Sauerman Scraper stores and reclaims 150,000 tons of stone on space between dock and cement mill.

Sauerman earthmoving machines have been providing efficient, economical materials handling in pits, quarries, and strip mines for over forty years. Low in first cost, they perform equally well for excavating, stripping, reclaiming and stockpiling.

One man operation, plus long life and low maintenance, insures low cost per cu. yd. handled.

DRAG SCRAPER EXCAVATOR

An economical machine for hill or pit excavation, reclamation and handling of materials, wet or dry. A rapid conveyor for long range earthmoving. Sizes ½ to 15 cu. yds. Ask for Catalog A.

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Dragline capacity is increased up to 50% or more on many jobs when a Crescent Scraper is used. Machine range is greatly extended when the scraper is used with a track cable and carrier. Ask for Catalog J.

SLACKLINE CABLEWAY EXCAVATOR

Unequalled for operations that require deep digging — especially underwater — and conveying to a high delivery point. Reaches down a hundred ft. or more—spans up to 1,000 ft. Sizes ½ to 3½ cu. yds. Ask for Catalog C.

DRAG SCRAPER STOCKPILER

As with all Sauerman machines, storing and reclaiming with a drag scraper stockpiler is a one man operation. It handles most any material, both indoors and out. Ask for Catalog E.

Write to Sauerman's experienced engineers for the size and type system best suited to your digging, hauling or storage requirements.

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MacArthur Concrete Pile Corp.
18 East 48th Street New York 17, N. Y.
New Orleans Cincinnati Pittsburgh
PILE DRIVING CONTRACTORS SINCE 1910

19.665 mi. Hy. SH 72, Proj. S 32 (9) and (10), Bee and Live Oak Counties;

South Texas Constr. Co., P.O. Box 3536, Corpus Christi, Tex., LB $593,592, foundation course, hot mix b. conc. 18.325 mi. Hy. SH 35, Proj. C 179-3 & 4-9 & 23, Brazoria and Matagorda Counties;

Texas Bitulithic Co., P.O. Box 10365, Dallas, Tex. LB $332,821, c. conc. pavement, flexible base, two course surf. tr. 2.39 mi. Hy. U.S. 69 and SH 11, Proj. F. 431 (10), Hopkins Co.;

T. R. Vardeman & Son, P.O. Box 485, Nacogdoches, Tex. LB $139,475, b. conc. 24.972 mi. Hy. SH 7, U.S. 96, 59, SH 103, 146, Proj. C 59-1-13, etc., Nacogdoches, Shelby, Sabine, Houston, Angelina and Polk Counties; LB $76,238, grading, structures, base and surf. 4.285 and Hy. FM 2026, Proj. S 1865 (1), Shelby Co. Bids May 18. CD 4/20, 4/26, 4/28, 5/5.

▲† **Merritt-Chapman & Scott Corp.**, 1615 Clay St., Houston, Tex., CA $1,098,127, water treatment plant, Inv. No. ENG-41-443-54-57, FORT HOOD, TEX. U. S. Eng., 100 W. Vickery St., Fort Worth, Tex. Bids May 12. CD 5/18, under LB.

Schmid & Faust, 3951 Fernwood St., Houston, Tex., LB, $164,498, est. $170,000, 6-lane 80 ft. wide 242 ft. long S. Main St. concrete bridge, HOUSTON, TEX. Harris Co., Court House, Houston, Tex., Bids May 14. CD 5/7.

BUILDINGS

LOW BIDS AND CONTRACTS

Winn-Senter Constr. Co., Railway Exchange Bldg., Kansas City, Mo., CA, $886,234, general contract Northeast Junior High SCHOOL, 48 and Reinhardt Sts., OLATHE, KAN. Shawnee-Mission High School Bd., Howard D. McEachen, supt., Mission, Kan. Bids May 13, awarded May 18. CD 5/21, under LB.

▲ **Chalmers & Borton**, Box 1031, Hutchinson, Kan., CA $1,360,000, 4 million bu. addnl. concrete GRAIN ELEVATOR, ENID, OKLA. Union Equity Co-operative, Enid, Okla. Ed Puckett, Enid, Okla. engr. Awarded May 17. CD 9/6/51.

Chapman & Dalton, Box 4474, Dallas, Tex., Own Forces, $360,000, 45 frame DWELLINGS, concrete slab fdn., DALLAS, TEX. CD 5/5.

▲ **BMFP Constr. Co.**, 2010 Avenue C, Lubbock, Tex., CA, $1,419,925, AUDITORIUM-COLISEUM, LUBBOCK, TEX. City, Lubbock, Tex. Bids May 3. CD 5/5, under LB.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Idaho, Mountain Home**—POLE STUBBING, etc.—B.A. 6/16—U. S. Eng., City-County Airport, Walla Walla, Wash., pole stubbing, replacement power poles and alterations to pole-mounted transformer sub-station, Mountain Home Air Force Base, ENG-45-165-54-28. CD 12/31/52.

† **Oregon**—B.A. 6/22—U. S. Eng., 628 Pittock Block, Portland, Zone 5, channel dredging in Columbia River at five bars between Fisher-Stella (Mile 58) and Wauna (Mile 43) (approx. 989,000 cu. yd. material), Serial No. CIVENG-35-026-54-152. CD 4/21/44.

BIDS ASKED—BUILDINGS

▲ **Calif., Santa Barbara**—RESIDENCE HALL—B.A. 6/15—University of California, Santa Barbara, 87,000 sq. ft., concrete block, residence hall. $1,000,000. Pereira & Luckman, 9220 Sunset Blvd., Los Angeles, archts. CD 2/17.

▲† **Calif., San Diego**—HOSPITAL—B.A. 6/24—Dpt. Navy, San Diego, 1,000-bed Naval Hospital, NOY 81916, Spec. 42162. $7,500,000. Plans deposit $300. Welton Becket & Assocs., 5657 Wilshire Blvd., Los Angeles, archts. CD 8/22/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Isbell Constr. Co.**, P.O. Box 2351, Reno, Nev., CA $1,313,182, runway, apron, taxiway, etc. Hubbard Field, ENG-04-203-54-203, RENO, NEV. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Bids Apr. 27, awarded May 17. CD 5/12 under LB.

CALIFORNIA—State Div. Hys., P. Wks. Bldg., Sacramento,

rejected bids Apr. 28, 2.8 mi. plant mix on untreated rock surf., steel girder bridge between Stevens Bar Bridge and Slate Gulch portions, Tuolumne Co. New bids May 26. CD 4/8.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,

Parish Bros., P.O. Box 6, Benicia and Carl N. Swenson, P.O. Box 558, San Jose, Calif., LB, $3,425,225, 6.6 mi. between Railroad Ave. and 1.4 mi. south of Petaluma Creek, Sonoma Co.;

Huntington Brothers, P.O. Box 474, Napa, Calif., LB, $233,903, 6.1 mi. near Ukiah, Mendocino Co.;

Granite Constr. Co., Box 900, Watsonville, Calif., LB, $157,844, 4.2 mi. near Planada, Merced Co.;

A. Teichert & Son, Inc., P.O. Box 816, Stockton, Calif., LB, $85,748, 0.5 mi. between McDougald Canal & French Camp Turnpike Stockton, San Joaquin Co.;

Madonna Constr. Co., P.O. Box 910, San Luis Obispo, Calif. LB, $287,070, 3.3 mi. between Buellton and Rt. 80, Santa Barbara Co.;

Munn & Perkins, P.O. Box 1092, Modesto, Calif., LB, $190,258, 1.3 mi. near Loyalton, Little Truckee Summit and Sattlee, Sierra Co. Bids May 19. CD 4/29.

▲† **Oberg Brothers Constr. Co.**, 401 West Florence Ave., Inglewood, Calif., CA, $1,403,264, Rio Hondo Channel, Washington Blvd. to Santa Ana Freeway, Los Angeles Co., CIVENG-04-353-54-34. CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Apr. 15, awarded May 5. CD 4/21, under LB.

▲ **Walsh Constr. Co.**, 785 Market St., San Francisco, Calif., CA $1,533,720, San Juan Tunnel for Lower Feeder of Colorado River Aqueduct, San Bernardino and Orange Counties, LOS ANGELES, CALIF. Metropolitan Water District of Southern Califorfnia, 306 W. 3 St., Los Angeles, Calif. Bids May 12, awarded May 18. CD 5/18, under LB.

▲ **A.B.C. Constr. Co.**, 12420 S. Bloomfield Ave., Norwalk, Calif., CA, $2,330,346, Schedule 70-P for constr. 3.88 mi. 108 in. concrete pipe line;

American Pipe & Constr. Co., 6435 Firestone Blvd., South Gate, Calif., CA, $2,057,955, Schedule 71-P 4.58 mi. 108 in. concrete pipe line extending from Cajalco Tunnel to Corona for Lower Feeder of Colorado River Aqueduct, LOS ANGELES, CALIF. Metropolitan Water District of Southern California, 306 W. 3 St., Los Angeles, Calif. Bids May 12, awarded May 18. CD 5/18, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

J. A. Neil Co., 3115 W. Mission Rd., Alhambra, Calif., CA $373,500, theological SEMINARY, CALABASAS, CALIF. Claretian Theological Seminary c/o Barker & Ott, archts., 4334 W. Pico St., Los Angeles, Calif.

▲ **The Vinnell Company, Inc.**, 1145 Westminister Ave., Alhambra, Calif., CA, $1,270,000 WAREHOUSE, at Palmdale Airport, PALMDALE, CALIF. North American Aviation, Inc., 5601 W. Imperial Hy., Inglewood, Calif. Bids Mar. 30. CD 4/6, under LB.

▲ **Stolte, Inc.**, 8451 San Leandro St., Oakland, Calif., CA, $2,117,411, De Anza High SCHOOL, El Sobrante, RICHMOND, CALIF. Richmond Union High School District, 1108 Bissell Ave., Richmond, Calif. Bids Apr. 15, awarded May 6. CD 4/28, under LB.

▲ **James I. Barnes Constr. Co.**, 940 Spring St., Redwood City, Calif., CA, $2,419,000 general contract;

Anderson & Rowe, Inc., 2501 Harrison St., San Francisco, Calif., CA, $393,152, plumbing and heating for Herbert Hoover Junior High SCHOOL, SAN FRANCISCO, CALIF. City, Dpt. P. Wks., City Hall, San Francisco, Calif. Bids Apr. 28, awarded May 17. CD 5/12, under LB.

▲ **Zaballos Brothers**, 850 Soto St., Hayward, Calif., CA, $1,486,000, Bancroft Junior High SCHOOL, SAN LEANDRO, CALIF. San Leandro Unified School District, 451 W. Joaquin Ave., San Leandro, Calif. Bids May 4, awarded May 14. CD 5/12, under LB.

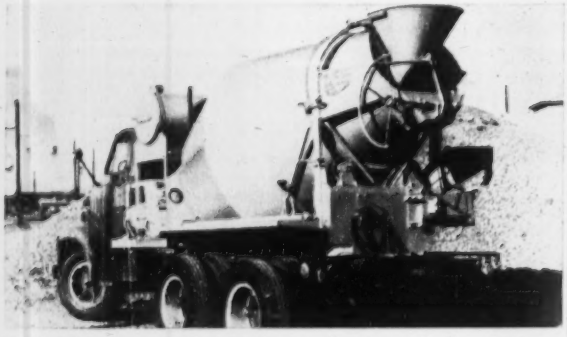
CANADA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Man., Winnipeg**—B.A. 6/15—City, G. L. Gardner, clk., City Hall, erecting steel superstructure for 453 ft. "Midtown" Bridge across Assiniboine River at Hargrave St. $1,700,000. J. B. Striowski, c/o owner, engr. CD 12/10.

(Continued on page 86)

TRANSCRETE AVAILABLE IN 3 TO 6 YARD CAPACITIES



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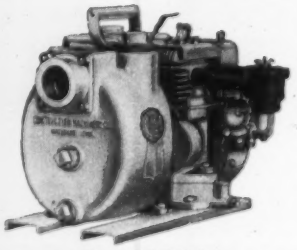

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New dual volute design makes priming rapid, automatic and dependable. Unipacked shaft seal is protected by rapidly spinning liquid screen. Fewer parts — easier to service.

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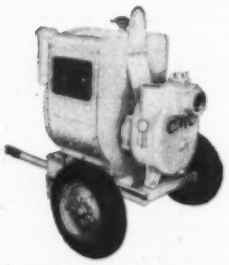

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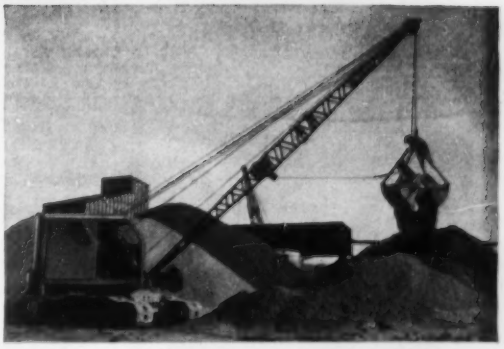

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Glance at the dragline photo again and note how the bucket is cast far beyond the boom point. This illustrates the easy operation, free-running machinery and accurate control plus fine balance which is built into this heavy-duty dragline. It has long, wide crawlers, alloy-steel bases, tandem drums in ball bearings, helical-cut gears, 517-cu.-in. gas engine, booster clutches and many other time-saving, money-making features.

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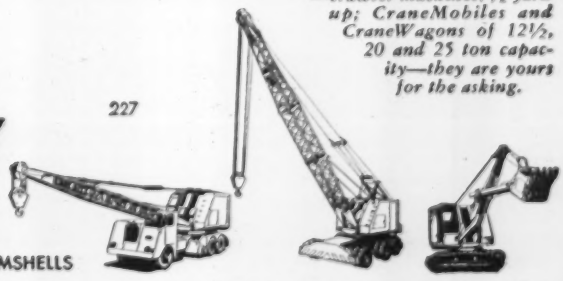

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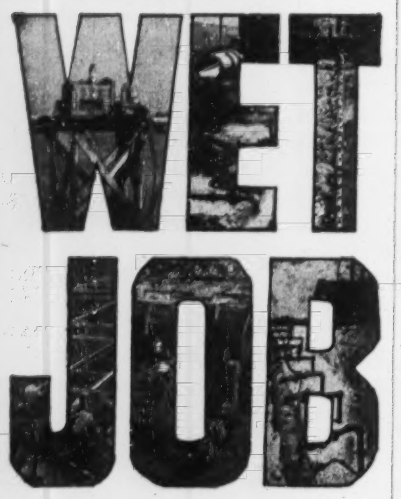

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(Continued from page 84)

BIDS ASKED—BUILDINGS

▲ **N. S., Halifax**—HOUSING—B.A. 6/8—Central Mortgage & Housing Corp., 1032 Gottingen St., 200-unit rental housing for Her Majesty's Forces stationed near here. $2,000,000. Plans deposit $25.

Ont., Welland—SCHOOL—B.A. 6/10—Welland Bd. Educ., Main St. N., 85x100x22 ft. high school addn. $340,000. Plans deposit $50. Norman A. Kearns, 40 Main St. E., archt. CD 11/25.

▲ **Ont., Petawawa**—BARRACK BLOCKS—B.A. 6/15—Defense Constr. Ltd., 56 Lyon St., Ottawa, three 250-men barracks blocks and one 500-men men's mess bldg. $1,500,000. Plans deposit $100.

▲ **Que., Montreal**—HOUSING—B.A. 6/16—Central Mortgage & Housing Corp., 1247 Guy St., 112-rental housing units to serve H. M. Armed Forces at Longue Pointe and Chabanel St. $1,150,000. Plans deposit $100. M. P. McAndrew, c/o owner, engr.

BUILDINGS
LOW BIDS AND CONTRACTS

Robertson Yates Corp. Ltd., 400 Wellington St. N., Hamilton, Ont., LS, $400,000, PLANT, Queen Elizabeth Way between Portage Road and Stanley Ave., NIAGARA FALLS, ONT. Joseph Aluminum Co. of Canada, Ltd., Niagara Falls, Ont. Bids Dec. 8. CD 12/2.

Bisson Constr. Ltd., 8 Canterbury Rd., Islington, Ont., Owner Builds. $420,000. two 42-suite APARTMENT BLOCKS, Kennedy Rd. near Foxridge Dr., Kennedy Park Subdivision, Scarborough, TORONTO, ONT.

Grigoire Perrault, Inc., 198 St. Joseph St., Joliette, Que., CA, $500,000, reconstr. COLLEGE HULL, QUE. College of St. Alexandre, Limbour, (North Hull), Que. A. Martineau, 200 Bay St., Ottawa, Ont., archt.

▲ **Key Constr. Ltd.**, 1040 Bleury St., Montreal, Que., CA, $1,769,900, SUPPLY SCHOOL, MESS and 3 QUARTERS at R. C. Navy, VILLE LA SALLE, QUE. Defense Constr. Ltd., 56 Lyon St., Ottawa, Ont. Bids Apr. 28. CD 4/14.

LATIN AMERICA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Uruguay**—Bids Asked—Usinas Electricas y Los Telefonof, Republic of Uruguay, Montevideo, design and construct Rincon de Baygorria Hydro Electric Proj. on Rio Negro. $58,000,000. CD 5/24/49.

Proposed Projects

WATER SUPPLY

▲ **O., Cincinnati**—City, City Hall, WW pumping station, California Ave. $5,000,000; water lines throughout city, $6,000,000. Hamilton Co. will share cost of water lines. Black & Veatch, P. O. Box 6071, Kansas City, Mo., consult. engrs. T. J. Montgomery, city engr. George Lemmel, cd. engr. CD 1/2/46.

▲ **Que., Riviere des Prairies**—Municipality, water mains, $1,660,000. Beauchemin & Hurter, 1117 Ste. Catherine St., Montreal, consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Fla., Fort Lauderdale**—City, City Hall, financing underway for sanitary sewerage imprvs. $5,000,000. Smith & Gillespie, P.O. Box 1048, Jacksonville, consult. engrs. CD 2/11.

▲ **N. C., Winston Salem**—City, City Hall, voted bonds May 14, extending, enlarging, imprv. sewage disposal sys. $6,500,000. CD 4/20.

▲ **Que., Riviere de Prairies**—Municipality, sewers, $1,234,000. Beauchemin & Hunter, 1117 Ste. Catherine St. W., Montreal, consult. engrs.

BRIDGES

▲ **B. C., Vancouver**—City, City Hall, bridge between Vancouver and Sea Island Airport to replace Marpole Bridge, $1,200,000. CD 11/15/49.

STREETS AND ROADS

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,
Leflore Co.—grade, drainage, surf. 9 mi. U.S. 271 near Gaston, $1,750,000.
Okfuskee Co.—resurf. U.S. 75 on Main St. through Weleetka, $88,000.
Oklahoma Co.—four lane U.S. 66, N.W. 39 from Drexel to Meridian Sts., 2.1 mi., $650,000. G. H. Bittle, c/o owner, engr.

EARTHWORK, WATERWAYS

▲ **Texas**—Dalworth Soil Conservation Dist., c/o W. T. Crouch, Arlington, const group 18 earthen small detention dams in Mountain Creek area to create a chain of lakes between Dallas and Fort Worth. $1,200,000. J. H. Johnson, c/o owner, Dist. Soil Conservation Engr.

AIRPORTS

▲† **Calif., March Air Force Base**—OPERATIONS APRON—U. S. Eng., 751 S. Figueroa St., Los Angeles, strengthen operations apron, constr. access hangar apron, hydraulic refueling sys., March Air Force Base, $1,130,000. Porter, Urquhart & Beavin, 3568 W. 3 St., Los Angeles, consult. engrs. CD 12/10/52.

▲ **O., Cleveland**—AIRPORT—City, Dpt. P. Properties, John J. Lucuoco, dir., City Hall, terminal bldg., $250,000; land fill, soil stabilization and constr. of main runway, $1,900,000 at Lakefront Airport. Thomas H. Jones, comm. Div. Design & Constr. c/o owner. CD 11/7/52.

▲ **Wash., Seattle**—MATERIAL HANDLING BLDG.—Boeing Airplane Co., 7755 E. Marginal Way, 1 story, 480x600 ft., material handling bldg. $2,000,000. CD 5/7/52.

▲† **Wash., Whidbey Island**—HOUSING—Pub. Wks. Officer, Thirteenth Naval District, 1611 W. Wheeler St., Seattle, housing for families of servicemen at Naval Air Station, $4,245,000.

PUBLIC BUILDINGS

▲ **Conn., New Britain**—SCHOOL—City, Dr. J. T. McCook, supt. Schools, 27 Hillside Pl., high school, west of Carleton St. on north side of Eddy Glover Blvd., $1,200,000.

Idaho, Boise—SCIENCE, etc.—Boise Junior College, Boise, voted bonds, physical education and science bldg. $990,000. Frank Hummel, 1324 Idaho St., archt. CD 4/19.

▲ **Mass., Acton**—SCHOOL—Towns of Acton and Littleton, c/o S. W. Haynes & Assoc., archts., 336 Main St., Fitchburg, Nagon Regional School adjacent to Blanchard Memorial, West Acton, $1,200,000. CD 12/9.

▲ **Mich., Ann Arbor**—FIELD HOUSE, etc.—Bd. Regents University of Michigan, W. K. Pierpont, vice pres., Ann Arbor, field house, $4,500,000; pressbox at football field, $300,000; plans by Lee and Kenneth C. Black, 706 Capitol Savings & Loan Bldg., Lansing, administration bldg. and men's swimming pool, $1,200,000.

▲ **Mich., Birmingham**—SCHOOL—City, Irene E. Hanley, clk., $3,500,000 bond election June 14. Junior High School, high school addn. CD 11/25/52.

▲ **Mich., Royal Oak**—SCHOOL—City, Gladys Holmes, clk., plans by O'Dell, Hewlett & Luckenbach, 950 N. Hunter Blvd., Birmingham, high school, $2,500,000; elementary school, Oak Ridge and Starr Sect., $500,000.

▲ **N. J., Trenton**—MEDICAL CENTER—State Institutions Dpt., State House, general medical centre for State of New Jersey, $25,000,000.

▲ **N. Y., Great Neck**—HIGH SCHOOL—Great Neck School Bd., 345 Lakeville Rd., plans by Alfred Hopkins & Assocs., 415 Lexington Ave., New York, Zone 17. Junior High School for 1,400 pupils and Senior High School for 1,400 pupils. $1,000,000.

▲ **O., Cleveland**—HOSPITAL BLDGS.—City, Dpt. Health & Welfare, Bell Greve, dir., City Hall, plans by Anthony Gattozzi, city archt., c/o owner, rehabilitation existing bldgs $500,000; major alterations to existing structures for special uses, incl. new wards, supply facilities and the school of nursing, $750,000; constr. maintenance bldg., site development and development of new parking areas, $750,000. CD 11/7/52.

▲ **Tex., Houston**—SCHOOL—Houston Independent School Dist., 1300 Capitol St., plans by H. Voelcker & Assocs., 1212 Dennis St., 3 story, concrete, steel framing, masonry converting Dotson Elementary School into Junior High School, $1,500,000. Milton McGinty, 2425 Ralph St., superv. archt. George Schmidt, 616 Cortlandt St., and Charles V. Chenault, 1202 Dennis St., consult. engrs. CD 11/11.

▲† **Utah, Monticello**—MILL—Atomic Energy Comm., Grand Junction, Colo., uranium mill expansion $1,000,000, Gallagher Co., 545 W. South St., Salt Lake City, consult. engr. CD 1/25.

▲ **Va., Radford**—SCHOOL—City, City Hall, Radford, voted $1,000,000 bonds, school constr.

▲ **Wis., Milwaukee**—SCHOOL—Bd. School Directors, 1111 N. 10 St., plans by Gates, Weiss & Kramer, 611 N. Broadway, Zone 2. Center-Pierce School. $1,200,000. CD 9/10/50.

COMMERCIAL BUILDINGS

▲ **Calif., Buena Park**—DWELLINGS—Volk-McLain Co., c/o E. H. Fickett, archt., 5657 Wilshire Blvd., Los Angeles, 118 frame, stucco dwellings. $1,500,000.

▲ **Calif., Los Angeles**—DWELLINGS—Diller Building Corp., 8549 Wilshire Blvd., 197 frame, stucco dwellings, Kagel Canyon, Osborne, Canterburry and Beachy Sts. $1,856,000.

Calif., Los Angeles—DWELLINGS—Woodley Gardens, Inc., 5658 W. 3 St., Los Angeles, 97 frame, stucco dwellings in Granada Hills Area, $950,000.

▲ **Conn., Hartford**—SHOPPING CENTER—Hartford Redevelopment Agency, William H. Putnam, pres., 1010 Wethersfield Ave., shopping center, area between Market, Fruit, Talcot and State Sts. $5,000,000.

▲ **D. C., Wash.**—HOTEL, etc.—Potomac Plaza Development Corp., c/o Hegeman-Harris Co., Inc., 30 Rockefeller Plaza, New York 20, N. Y., plans by Harrison & Abramovitz, 630 Park Ave., New York 21, N. Y., and Chester L. Churchill, consult. archt., 17 E. 49 St., New York 17, N. Y., hotel, office bldg. and apartment houses on tract on 24 St. G and H Sts. between

Virginia Ave. and New Hampshire Ave. $57,000,000. CD 3/19/53.

▲ **Mo., Richmond Heights (St. Louis 17 P.O.)**—SHOPPING CENTER—Stix, Baer & Fuller Co., Arthur B. Baer, pres., 6 St. and Washington Ave., St. Louis, Zone 1, plans by Jamieson, Spearl, Hammond & Grolock, 1696 Arcade Bldg., 812 Olive St., St. Louis, Zone 1, two 1 story, stone, brick, concrete steel shopping center bldgs., (Westroads Center) total of approx. 130,000 sq. ft. floor space in all, one bldg to be occupied by specialty shop, shoe store, 5 or 6 other shops and drug store and other bldg to contain supermarket and variety store, Clayton Rd and Brentwood Blvd., $1,000,000.

▲ **N. Y., Flushing**—BUS TERMINAL—Webb & Knapp, 383 Madison Ave., New York, Zone 17, 4-story bus terminal, Roosevelt Ave. between Union and Bowne Sts. $4,000,000-$5,000,000. CD 8/9/46.

▲ **N. Y., New York**—BUILDING—Associated Hospital Service, 80 Lexington Ave., Zone 16, plans by Carson & Lundin, 50 Rockefeller Plaza, Zone 20, 10 story bldg. addn., 129-133 E. 26 St. $1,175,000.

▲ **N. Y., New York**—BUILDING—Canada House, c/o Ray Lawson, Canadian Consul General, 620 Fifth Ave., Zone 20, bldg. to house all Canadian activities in New York on site near Grand Central Terminal. $8,000,000-$10,000,000.

▲ **N. Y., New York**—APARTMENT—Syndicate, c/o Joseph L. Ennis & Co., 51 E. 42 St., Zone 17, plans by H. I. Feldman, 415 Lexington Ave., Zone 17, 15 story, 134-family apartment, 284-288 Lexington Ave. $1,300,000.

▲ **Tex., Dallas** — COLISEUM-GYMNASIUM — Southern Methodist University, Dallas, plans by Smith & Mills, Mercantile Bank Bldg., coliseum-gymnasium for basketball and various other athletic courts, seating 10,000, to incl. olympic type concrete swimming pool, 2,000 seat capacity. $2,225,000. CD 3/4/53.

▲ **Tex., Houston**—OFFICE, etc.—Ada Oil Co., c/o K. S. Adams, Jr., 609 Hughes St., plans by Hamilton Brown & Donald Barthelme, 2017 W. Gray St., 13 story office, parking garage, fdn. will be built to carry up to approx. 20 storys, Holcombe Blvd. between Prudential Bldg. and Shamrock Hotel. $3,000,000.

▲ **Alta., Calgary**—CATHEDRAL—Roman Catholic Diocese of Calgary, 910 7 A St. N.W., plans by Hodges & Bates, 1603 A Centre St. N., 91x188 ft., 125 ft. high belfry tower, steel, stone, brick St. Mary's Cathedral, 18 Ave. and 1 St. W. $1,000,000.

▲ **Man., Transcona**—DWELLINGS—Kildonan Realty Co., Kildonan, 400 dwellings on new housing development, Oxford St. $3,000,000.

▲ **Ont., Toronto**—HOSPITAL—Seventh-Day Adventists, c/o K. L. Graham, archt., 18 Rosemount Ave., Westmount, 6 story, 100 bed, 2 wings, rein.-con., steel, terra cotta tile, brick, "Branson" Hospital, North York, Finch Ave. and Bathurst St. $1,000,000. CD 8/28/51.

INDUSTRIAL BUILDINGS

▲ **Neb., Grant**—GRAIN ELEVATOR—Burrus-Mill Elevator Co., Mercantile bldg., Dallas, Tex., grain elevator. $6,000,000

▲ **Okla., Enid**—PLANT—Champlin Refining Co., Enid, enlarging present refining plant to mfg lubricating and fuel oils. $4,000,000. Joe N. Champlin, c/o owner, engr.

▲ **Pa., Erie**—PLANT—Bucyrus-Erie Co., 1046 Monroe Ave., South Milwaukee, Wis., 1 story, steel, mfg. plant addn., concrete fdn $4,000,000.

▲ **Tex., Odessa**—PLANT, etc.—Texas Gulf Production Co., Odessa, natural gas plant, $1,800,000; warehousing or storage, $100,000.

UNCLASSIFIED

▲† **N. Y., Brooklyn**—ELECTRIC REHABILITATION—U. S. Eng., 80 Lafayette St., New York, Zone 13, electric rehabilitation, FY 1955, Brooklyn Army Base. $1,000,000-$3,000,000. Leonard S. Wegman, 9 E. 45 St., New York, Zone 17, consult. engr.

▲ **O., Cleveland**—PARKS—City, Dpt. P. Properties, John J. Lucuoco, dir., City Hall, imprv. 13 city parks, incl. grading, drainage, paving for new roads and walks, etc. for redevelopment and restoration in Gordon Park Area. $1,070,000. Thomas H. Jones, comn. Div. Design & Constr., c/o owner, CD 3/1/43.

▲ **O., Cleveland**—LAKEFRONT AREA DEVELOPMENT, etc.—City, Dpt. P. Properties, John J. Lucuoco, dir., City Hall, minor bulkheading and onshore site development along Central Lakefront area, $1,250,000; Wildwood Beach-Mooring for small boats, control bldg. and onshore development, $350,000; Gordon Park Beach-Mooring docks for small boats, control bldg., onshore development, $200,000; White City Beach-Mooring docks for small boats, control bldg. and onshore development, $350,000; Edgewater Beach—Mooring docks; harbor control and comfort station bldgs., paving roads, parking, boat storage facilities, $1,075,000; E. 55 St. constr. of harbor facilities for small boats and onshore site imprvs. $550,000. Thomas H. Jones, comn. Div. Design & Constr., c/o owner. CD 3/1/43.

▲ **Ontario**—RAILROAD—Canadian National Rys., R. O. Stewart, ch. engr., 360 McGill St., Montreal, Que., 27 mi. railroad construction, Hillsport westward. $3,780,000.

▲ **Quebec**—RAILROAD—Canadian National Rys., R. O. Stewart, ch. engr., 360 McGill St., Montreal, 135 mi. railroad construction from Beattyville to Chibougamau. $35,000,000.

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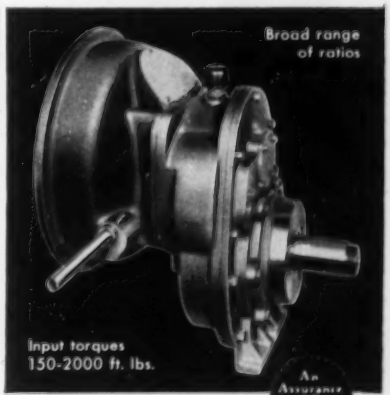

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This revision is based on long industry experience, substantiated by the study of truck mixers conducted at the University of Maryland, in 1952, reported by Stanton Walker and D. L. Bloem, respectively Director and Assistant Director of Engineering of the NRMCA. This study, the most extensive ever made, involved 2000 cylinders, 600 slump tests, 1000 Kelly Ball tests, 300 wash tests and 1200 sieve analyses—a total of 5100 tests.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 7 Connecticut June 10 Massachusetts
STREETS AND ROADS
June 7 Connecticut June 10 Massachusetts

BIDS ASKED—BUILDINGS

Me., Augusta—GERIATRIC—B.A. 6/9—State, Dpt. Institutional Service, State House, geriatric bldg. State Hospital, $900,000. Plans deposit $35 refundable, Bunker & Savage, 283 Water St., archts. CD 11/5.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Verrier Constr. Co., 65 Commercial St., Portland, Me. LB $864,210. Contr. B-1 marine ferry terminal, BAR HARBOR, ME. State, Maine Port Auth., State Pier, Portland, Me. Bids May 20. CD 5/11.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 3 New Jersey June 8, 15 Maryland
STREETS AND ROADS
June 11 Pennsylvania June 15 New Jersey

BIDS ASKED—BUILDINGS

▲ Pa., Bedford—HIGH SCHOOL—B.A. 6/14—Bedford School Dist. Auth., Bedford, 2 story brick, steel high school addn. $1,300,000. Plans deposit $100. Eric Fisher Wood, 209 W. Pitt St., archt.

N. Y., Brooklyn — HIGH SCHOOL — B.A. 6/17 — St. Michael's Commercial High School for Girls, 225 Jerome Ave. (selected list of bidders) 3 story high school. $900,000. Paul C. Reilly, 111 Fifth Ave., New York, Zone 3, archt. CD 3/23/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ NEW JERSEY and PENNSYLVANIA—Pennsylvania Turnpike Comn. and New Jersey Turnpike Auth., Administration Bldg. of Pennsylvania Turnpike Comn., 11 North Fourth St., Harrisburg, Pa.,

Merritt-Chapman & Scott Corp., 260 Madison Ave., New York 16, N. Y., LB $3,688,233, Contract PN 1, 2 river piers within the stream bed and 2 land piers, 1 on Pa. shore and 1 on N. J. shore; Contract PN-2, 16 land piers and 1 abutment all on Pa. side of river; PN-3, 10 land piers and 1 abutment, all on N. J. side of river, for the Delaware River Turnpike Bridge planned as a connection between Pennsylvania and New Jersey Turnpikes. Bids May 25. CD 4/29.

▲ PENNSYLVANIA—State Hy. Dpt., North Office Bldg., Harrisburg,

J. Robert Bazley, Inc., P.O. Box 117, Pottsville, Pa., LB $466,011, constr. 40,128 ft. c. conc. pavement variable in width, wid'n. existing road and surf. new and existing base with bit. surf. T.R. 11, Northumberland Co.;

Ralph V. Daniels, Inc., 338 N. 29 St., Camp Hill, Pa. LB $100,599, wid'n. 23,924 ft. existing road with crushed aggregate base and bit. surf. variable in width, Northampton Co.;

J. D. Eckman, Inc., Box 176, Atglen, Pa., LB $226,962. constr. 11,183 ft. crushed aggregate base with bit. surf. variable in width, T.R. 72, Lancaster Co.;

A. C. Hack & Sons, Lightstreet Rd., Bloomsburg, Pa., LB $119,979, constr. 2,872 ft. crushed aggregate base with bit. surf. variable in width, two I-beam bridges, L.R. 08081 (1); L.R. 08083 (2), Bradford Co.;

McCormick Contg. Co., 22 N. Grove St., Lock Haven, Pa. LB $66,298, constr. 2,385 ft. crushed aggregate base with bit. surf. 18 ft. wide, T.R. 364, Clinton Co.;

W. G. Rider, Melrose Pl., Belle Vernon, Pa., LB $395,080, wid'n. 29,200 ft. existing road with crushed aggregate base and bit. surf. variable in width, T.R. 15, Tioga Co. Bids May 21. CD 4/30.

▲ DELAWARE—State Hy. Dpt., Dover,

John Julian Co., 109 S. DuPont Rd., Elsmere, Del., LB, $162,960, Contract 1261, c. conc. Marrows Road, Fed. Aid Proj. S-183 (1), New Castle Co.;

Empire Constr. Co., 31 S. Calvert St., Baltimore, Md., LB, $663,540, Contract No. 1224 (2), Walnut Street Extension, Sect. 2, Pennsylvania R.R. Underpass, Fed. Aid Proj. UG-1 (7), New Castle Co.;

George & Lynch, Inc., Delaware Trust Bldg., Wilmington, Del., LB, $289,090, Contract 1287, Fieldsboro to McDonough 5.177 mi. Fed. Aid Proj. F-87 (7), New Castle Co. Bids May 19. CD 4/30.

BUILDINGS

LOW BIDS AND CONTRACTS

Park Gardens Homes, c/o Henry A. Klar Realty Co., 220-02 Horace Harding Blvd., Bayside Hills, N. Y. Owner Builds. $750,000. 65 HOUSES, tract on Park Ave., north of Jericho Turnpike, HUNTINGTON, N. Y.

▲ George A. Fuller Co., 597 Madison Ave., New York 22, N. Y. CA Approx. $2,000,000. FACTORY addn., Bary St. and Oak Point Ave., NEW YORK, N. Y. National Gypsum Co., Baker Bldg., Delaware Ave., Buffalo, N. Y.

▲ Paul Tishman Co., Inc., 21 E. 70 St., New York 21, N. Y. LB $7,958,448, general constr.;

Harry Starkman & Bros., 348 Brook Ave., New York 54, N. Y. LB $687,000, heating and ventilating;

Arc Electrical Constr. Co., Inc., 739 Second Ave., New York 16, N. Y., LB $488,400, electrical work;

J. L. Murphy, Inc., 340 E. 44 St., New York 17, N. Y. LB $794,200, plumbing for General Grant HOUSES, Proj. No. NY-5-30, Sect. 1, incl. Bldgs. Nos. 1 to 5 inclusive and garage bldg. in area bounded generally by W. 125 St., Amsterdam Ave., LaSalle St. and Broadway, Manhattan Boro, NEW YORK, N. Y. New York City Housing Auth., 63 Park Row, New York 38, N. Y. Bids May 25. CD 5/17.

Doylesford Co., Gradyville, Pa., Separate Contracts. $680,000. RESIDENTIAL DEVELOPMENT, Doylesford Hills, PAOLI, PA.

Rea Constr. Co., 27 Woodlawn Ave., Crafton, Pa., CA $674,900. 1 and 2 story, 98x386 ft. brick St. Clair Grade SCHOOL, PITTSBURGH, PA. Bd. Educ., Forbes and Bellefield St., Pittsburgh, Pa. Bids Mar. 16. CD 3/25, under LB.

▲ Sherry Richards Co., Inc., 2281 N. LaSalle St., Chicago, Ill., LB $13,349,300, general constr.;

Sauer, Inc., 2701 East St., Pittsburgh, Pa., LB $1,597,000, plumbing; LB $1,244,000, heating, ventilating, air-conditioning;

Lord Electric Co., Gateway Center, Pittsburgh, Pa., LB $1,225,000, electrical work;

Westinghouse Electric Corp., Gulf Bldg., Pittsburgh, Pa., LB $339,516, elevators and dumbwaiter for 1 story, 8 story, 3 story, 2 story, steel, concrete General HOSPITAL and misc. bldgs., Scott Twp., PITTSBURGH, PA. Bd. Comrs. Allegheny Co., County Office Bldg., Pittsburgh, Pa. Mitchell & Ritchey, 524 5th Ave., and Button & McLean, 119 E. Montgomery Ave., Pittsburgh, Pa., archts. Harry L. King, c/o owner, resident engr. Bids May 18. CD 4/8.

Modern Constr. Co., 8500 Defense Hy., Lanham, Md. Owner Builds, $840,000. 56 brick detached HOMES in Lewis Heights, LANHAM, MD. Walton & Maddon, 3510 Rhode Island Ave., Mount Ranier, MD., archts.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 8 North Carolina June 11 Kentucky
June 30 Louisiana
STREETS AND ROADS
June 8 North Carolina June 11, 18 Kentucky
June 11 Tennessee June 16, 30 Louisiana

BIDS ASKED—BUILDINGS

Ky., Erlanger — SCHOOL — B.A. 6/18 — Bd. Educ., 1 story, brick, rein.-con. school, Barnett Ave. $750,000. E. C. Landberg & Assocs., Garfield Place, Cincinnati, O., engrs.-archts. New date. CD 4/6.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† Ray M. Lee Co., 1004 Edgewood Ave. N. E., Atlanta, Ga., LB $2,779,667, hospital, Mac Dill Air Force Base, ENG. 08-123-54-52. TAMPA, FLA. U. S. Eng., P. O. Box 4970, Jacksonville, Fla. Bids May 18. CC 3/24.

▲† Louisiana Paving Co., Inc., Ruston, La. CA $2,574,173. paving 415,000 sq. yd. apron aircraft fueling sys., airfield lighting sys. Barksdale Air Force Base, ENG-03-050-54-44, SHREVEPORT, LA. U. S. Eng., Gay Bldg., Little Rock, Ark. Bids May 19. CD 4/27.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ Leslie Constr. Corp., c/o Herman York, archt., 90-04 161 St., Jamaica, N. Y. Owner Builds. $7,000,000. 600 HOUSES, 150-acre tract, Little Creek Rd. and Military Hy., NORFOLK, VA.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 15 Indiana June 22 Ohio
STREETS AND ROADS
June 15 Indiana June 22 Ohio

Ill., Deerfield—B.A. 6/14—Village, Village Hall, sewage treatment plant and sewers. $800,000. Baxter & Woodman, 123 N. Williams St., Crystal Lake, engrs. CD 1028.

▲ O., Cleveland—B.A. 6/24—Comrs. Cuyahoga Co., Court House, Zone 14, grade, drain, pave approx. 4,413 lin. ft. Wilson Mills Rd. from Green to Trebisky Rd., South Euclid, two 28 ft. strips with curbing, constr. new rein.-con. arch bridge over Euclid Creek 362.29 ft. from abutment to abutments. $1,196,500. Plans deposit $25. Albert S. Porter, Standard Bldg., Zone 14, co. engr.

BIDS ASKED—BUILDINGS

▲ O., Cincinnati—HIGH SCHOOL—B.A. 6/22—Bd. Educ., 216 E. 9th St., Madisonville Junior High School. $1,785,000. Plans deposit $50. Potter, Tyler, Martin & Roth, 128 E. 6 St., archts. William D. Ehlers, Union Trust Bldg., engr. CD 2/27/53.

O., Urbana—COURT HOUSE, etc.—B.A. 6/23—Comrs. Champaign Co., Court House, new court house and sheriff's residence. $600,000. Plans deposit $30, $8 for equipment. Philip T. Partridge, 914 Main St., Cincinnati, Zone 2, archt. CD 2/3/53.

O., Maple Heights—SCHOOL—B.A. 6/24—Bd. Educ., 5500 Clement Dr., Maple Heights, c/o Cleveland P.O., 1 and 2 story approx. 27,000 sq. ft. masonry Raymond St. School. $600,000. Plans deposit $20. Outcalt, Guenther & Assocs., 13124 Shaker Square, Cleveland, Zone 20, archts. CD 11/9.

▲ Mich., Mount Pleasant—CUSTODIAL, etc.—B.A. 6/29—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, two 1 story, masonry, steel custodial bldgs., 1 story, 192x271 ft. State Home & Training School, $1,700,000. Plans deposit $25. Roger Allen & Assoc., 1126 McKay Tower, Grand Rapids, Zone 2, archts. CD 7/29.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† Grant Contg. Co., Greenville, LB. $699,975, est. $576,450, placing 1,525,000 cu. yd. hydraulic fill in levee borrow pit at Degognia and Fountain Bluff Levee and Drainage Dist., Proj. Item VI-A (2) Jackson, CIVENG-23-065-54-105, ILLINOIS. U. S. Eng., 420 Locust St., St. Louis 2, Mo. Bids May 21. CD 4/27.

▲ WISCONSIN—State Hy. Comn., State Office Bldg., Madison,

J. R. Griffith Co., P.O. Box 58, Racine, Wis., CA, $1,070,299, Contracts 1 and 2, c. conc. 10.728 mi. U.S. Hys. 41 and 141, Proj. F 02-5 (12) and F 02-5 (13) Brown and Oconto Counties. Bids May 4. CD 5/10, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

Westbrook Homes, Inc., 3349 Harrison Ave., Cincinnati, O. Owner Builds. $850,000. 40 one story brick, bsmt. HOMES, Telford Ave., CINCINNATI, O. Joseph Allen, 4638 Glenway Ave., Cincinnati, O., engr. Awarded May 18.

George W. Lathrop & Son, 1510 Montcalm St., Toledo, O. CA $860,664, 5 story, Y. W. C. A. BLDG., 1018 Jefferson St., razing present bldg., TOLEDO, O. Young Womens Christian Assn., Henrietta Marimon, exec. dir., 13 and Jefferson Sts., Toledo, O. Awarded May 18. CD 9/12/51.

▲ Steinle-Wolfe, Inc., 128 N. Jefferson St., Fremont, O., CA $2,843,800. 304-unit HOUSING, Kimmel Brook Homes, Victor Ave., YOUNGSTOWN, O. Youngstown Metropolitan Housing Auth., 976 W. Federal St., Youngstown, O. Bids May 18, awarded May 20. CD 5/25, under LB.

▲ Gateway Erectors, 3233 Grand Ave., Chicago, Ill., CA, $1,500,000, WAREHOUSE and GARAGE, CHICAGO, ILL. United Parcel Service Co., 1233 W. Monroe St., Chicago, Ill. David Levy, 70 E. 45 St., New York, N. Y., archt. Awarded May 13.

A. E. Fossier & Co., 342 Dover Ave., Lagrange, Ill., Own Forces, $900,000, 30 HOMES, LAGRANGE, ILL.

▲ Raymond Lutgert, 8333 S. Cicero St., Oaklawn, Ill., Owner Builds, $3,000,000, 30 Store SHOPPING CENTER, 79 and Cicero Sts., on 20-acre site, OAKLAWN, ILL. Sidney H. Morris, 134 N. LaSalle St., Chicago 1, Ill., archt.

▲ Poirot Constr. Co., 2001 Pershing Rd., Chicago 9, Ill., CA, $4,000,000, 522,460 sq. ft. WAREHOUSE and 44,500 sq. ft. PRODUCE BLDG., RIVER GROVE, ILL. Consolidated Foods Corp., 135 S. LaSalle St., Chicago, Ill. A. Epstein & Sons, Inc., 2001 Pershing Rd., Chicago 9, Ill., archt. Awarded May 18.

D. F. Knox & Co., 1210 Washington St., Waukegan, Ill., Own Forces, $850,000, 50 HOMES on west side of WAUKEGAN, ILL.

▲† Collins & Catlin and A. J. Etkin Constr. Co., 10111 Capital Ave., Oak Park, Mich. CA $2,554,884. automotive components laboratory and controlled high temperature vehicular test cell, together with sewers, water and other work in connection therewith, Detroit Arsenal, DETROIT, MICH. U. S. Eng., 1900 Cadillac Tower, Detroit 26, Mich. Bids May 18. CD 5/4.

August B. Johnson, Inc., Flint, Mich. LB $623,897. general contract elementary SCHOOL, GRAND BLANC, MICH. Grand Blanc Twp. Bd. Educ., Ezra Perry, secy. unit School Dist., Grand Blanc, Mich. Bids May 13. CD 4/15.

E. J. Kahmann Co., Port Huron, Mich. CA Est. $800,000. 2 story, 140x155 ft. dial TELEPHONE BLDG., PORT HURON, MICH. Michigan Bell Telephone Co., 1365 Cass Ave., Detroit, Mich. Bids May 13. CD 5/11.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 11 Minnesota June 15 Texas
STREETS AND ROADS
June 11 Minnesota June 15, 16 Texas

† Tex., Del Rio—HANGARS—B.A. 6/23—U. S. Eng., Box 1229, Galveston, maint. hangar with shops,

Laughlin Air Force Base, Inv. No. ENG. 41-243-54-89. $500,000-$1,000,000. CD 5/21.

▲† **Tex., Kelly Air Force Base**—WAREHOUSE—B.A. 6/28—U. S. Eng., Box 1229, Galveston, constr. AMC warehouse, Inv. No. ENG-36. Est. $3,000,000-$5,000,000. CD 5/11.

BIDS ASKED—BUILDINGS

Neb., Lincoln—HIGH SCHOOL—B.A. 7/8—Bd. Educ., 720 S. 22 St., Lefler Junior High School. $970,000. Hazen & Robinson, Stuart Bldg., archts. CD 9/16.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MINNESOTA**—State Hy. Dpt., 1246 University Ave., St. Paul,

J. Brown Constr. Co., Mankato, Minn., LB **$536,690**, grav. base, plant-mixed bit. surf. bridges 11.2 mi. between Geneva and Steele Center, Freeborn and Steele Counties;

O. B. Ashbach & Sons, 2975 Hamline Ave. N., St. Paul, Minn. LB **$798,760**, c. conc. grav. base, plant-mixed bit. surf. 6.3 mi. between 37 Ave. in Columbia Heights 2.1 mi. north of T.H. 10, Anoka Co. Bids May 21. CD 5/6.

▲ **MISSOURI**—State Hy. Dpt., Jefferson City,

C. H. Atkinson, Chillicothe, Mo. LB **$82,479**, base wid'n, b. conc. existing c. conc., Jasper Co.; LB **$184,995**, graded earth, base wid'n, b. conc., Jasper Co.;

Masters-Jackson Paving Co., Woodruff Bldg., Springfield Mo. LB **$77,271**, rolled stone base, b. conc. plant mix resurf. grav. or crushed stone base, Greene Co.; LB **$91,845**, b. conc. plant mix resurf. grav. or crushed stone, Greene Co.;

Koss Constr. Co., 205 Farm Bureau Bldg., Des Moines, Ia. LB **$688,069**, wid'n., b. conc., 2.237 mi. Greene Co.; LB **$91,343**, c. conc. 0.436 mi. Montgomery Co.; LB **$514,324**, graded earth 5.572 mi. Montgomery Co.; LB **$359,144**, graded earth, 4.764 mi. Montgomery Co. Bids May 20. CD 5/6.

J. S. Alberici Constr. Co., 1550 Irving Ave., St. Louis 20, Mo. LB **$947,120**, addnl. storage basins, conduits for Howard Bend water pumping station on Missouri River to increase capacity of plant from 80 to 120 m.g. per day, ST. LOUIS, MO. City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 and Market Sts., St. Louis 3, Mo. Bids May 18. CD 4/20.

▲ **NORTH DAKOTA**—State Hy. Dpt., Bismarck,

Schultz & Lindsay Constr. Co., 621 1st Ave. N., Fargo, N. D., LB **$886,049**, A.E.P.C. conc. pavement and incid. 11.144 mi. S.H. 44 from Drayton South, Proj. No. FI-1-365 (11), Pembina and Walsh Counties;

Butler Constr. Co., 901 N. 6 St., Grand Forks, N. D. LB **$256,462**, b. conc. surf. and incid. 17.327 mi. U.S. Hy. 52 and 281 and S.H. 7 from Carrington west, North and East, Proj. No. F-2 (8), F-101 (5) and F-151 (11), Foster Co.; LB **$253,348**, b. conc. surf. and incid. 21.424 mi. U.S. 281 from Sheyenne South, Proj. No. F-6 (3), F-660 (4), F-296 (9), F-8 (5), F-103 (4) and F-92 (4), Eddy and Foster Counties; LB **$134,635**, base, b. conc. surf. and incid. 9.034 mi. S.H. 21, east of Mott, Proj. No. F-256 (9), Hettinger Co.;

Archie Campbell, Inc., New Rockford, N. D., LB **$208,064**, tr. serv. gravel and incid. 12.212 mi. S.H. 21 from Carson East, Proj. No. F-39n (4) and F-68 (3), Grant Co.; LB **$116,880**, grav. surf. and incid. 13.024 mi. S.H. 3 from Rugby south, Proj. No. S-204 (3), Pierce Co.; LB **$176,927**, tr. serv. grav. and incid. 20.349 mi. U.S. 281 from Edgeley north, Proj. F-298 (4), LaMoure and Stutsman Counties. Bids May 21. CD 5/7.

Parsons Constr. Co., 2512 Deer Park Blvd., Omaha, Neb. LB **$958,058**, presidimentation basins and structures for water department, OMAHA, NEB. Metropolitan Utilities Dist., 18 and Harney Sts., Omaha, Neb. Bids May 19. CD 4/30.

† **Shelton Constr. Co.**, 2901 N. Harwood St., Dallas, Tex. CA **$848,937**, 50-bed hospital, Altus Air Force Base. Inv. No. ENG-34-066-54-13, ALTUS, OKLA. U. S. Eng., Box 61, Tulsa 2, Okla. Bids May 13. CD 5/20, under LB.

▲ **TEXAS**—State Hy. Comn., Austin,

J. O. Boswell, 3111 Harris Ave., Lubbock, Tex., LB **$67,075**, grading, structures, base and surf. 8.821 mi. Hy. FM298 and 745, Proj. C 884-3-2, Lamb Co.;

R. B. Butler, Inc., P.O. Box 471, Bryan, Tex., LB **$187,263**, grading, structures, base, surf. 11.795 mi. Hy. FM 1752 and 274, Proj. S 1796 (3), etc., Fannin Co.;

Cage Bros., 6959 San Pedro St., San Antonio, Tex., LB **$326,355**, flexible base, three course surf. tr. 9.689 mi. Hy. US 87, Proj. F 412 (4), Tom Green Co.;

Harry Campbell & Harry Newton, Rte. 5, Box 68-A, Abilene, Tex., LB **$793,837**, grading, flexible base, and hy. overpass 8.289 mi. Hy. US 67, Proj. FI 826 (12), Rockwall Co.;

Collins Constr. Co. of Texas, P.O. Box 1192, Austin, Tex., LB **$206,235**, hot mix b. conc. 40.005 mi. Hy. SH 36, Proj. C 181-1, 283-8&7, etc., Taylor and Callahan Counties.

Continental Constr. Co., Inc., P.O. Box 88, Port Lavaca, Tex., LB **$287,037**, flexible base, two course surf. tr. 27.93 mi. Hy. FM 863 and SH 202, Proj. S 644 (6), Duval Co.;

Ivan Dement, Inc., P.O. Box 1787, Amarillo, Tex., LB **$111,663**, grading, structures, base, surf. 5.359 mi. Hy. FM 2077 and 282, Proj. S 1960 (1), etc., Lipscomb and Roberts Counties.

J. R. Fanning, P.O. Box 1278, Lubbock, Tex., LB **$519,524**, flexible base, b. conc. 15.068 mi. Hy. US 380, Proj. C 126-1-9, Shackelford Co.;

Flenniken Constr. Co., P.O. Box 634, Shreveport, La., LB **$535,601**, flexible base, two course surf. tr. 12.887 mi. Hy. SH 105, Proj. S 925 (2), Hardin Co.;

Gulf Bitulithic Co., P.O. Box 2572, Houston, Tex., LB **$190,166**, flexible base, b. conc., 0.58 mi. Hy. US 75, Proj. FI 466 (22), Harris Co.;

O. W. Howard, Madisonville, Tex., LB **$135,152**, flexible base, one course surf. tr. 3.053 mi. Hy. SH 11, Proj. C 83-6-14, Wood Co.;

Heidenfels Bros., P.O. Box 1917, Corpus Christi, Tex. LB **$936,947**, wid'n., flexible base, and b. conc. 17.042 mi. Hy. US 77, Proj. F 1025 (1), Victoria Co.;

Killian-Keller Co., P.O. Box 393, Fredericksburg, Tex. LB **$90,216**, flexible base, two course surf. tr. 10.813 mi. Hy. US 290, Proj. F 127 (2), etc., Gillespie and Blanco Counties;

Ernest Loyd, P.O. Box 1120, Fort Worth, Tex., LB **$72,686**, foundation course, two course surf. tr. 1.496 mi. Hy. SH 22, Proj. C 120-3-10, Bosque Co.;

R. W. McKinney, P.O. Box 190, Nacogdoches, Tex., LB **$918,276**, foundation course, flexible base and b. conc. 12.084 mi. Hy. SH 289, Proj. S 51 (1), etc., Collin and Dallas Counties;

L. W. Pelphrey Co., P.O. Box 1166, Gladewater, Tex., LB **$648,056**, flexible base, b. conc. 6.766 mi. Hy. US 80, Proj. F 21 (5), Gregg Co.;

J. W. Perry, 501 Insurance Bldg., San Antonio, Tex., LB **$68,429**, grading, structures, base, surf. 5.42 mi. Hy. FM 2027, Proj. S 1903 (1), Brown Co.; LB **$80,158**, grading, structures, base, surf. 9.313 mi. Hy. FM 1929 and 1678, Proj. C 1651-6-6, etc., Concho Co.; LB **$66,984**, sealcoat 84.157 mi. Hy. FM 1602, 66, 215, 147, etc., Proj. C 550-6-2, C 596-3-3, etc., Hamilton, Hill, Bosque, Limestone, Coryell and Bell Counties; LB **$67,325**, recondition, flexible base, one course surf. tr. 16.588 mi. Hy. SH 87, Proj. C 304-4-12, Sabine Co.;

Public Constr. Co., P.O. Box 380, Denton, Tex., LB **$123,581**, b. conc. 20.082 mi. Hy. SH 64, Proj. F 115 (9), Smith and Van Zandt Counties; LB **$90,049**, hot mix b. conc. pavement and roadbed tr. shoulders 8.275 mi. Hy. US 287, Proj. C 43-9-19, Wichita Co.;

A. L. Sheppard, P.O. Box 1871, Vernon, Tex., LB **$68,253**, grading, structures, base, surf. 7.055 mi. Hy. FM 1642 and 338, Proj. R 2036-1&2-1&1, Childress and Collingsworth Counties;

Dean Skinner, P.O. Box 4057, Austin, Tex., LB **$170,096**, grading, structures, base, surf. 9.21 mi. Hy. FM 1885, Proj. C 649-2-4, Parker Co.;

C. Hunter Strain, P.O. Box 1057, San Angelo, Tex., LB **$166,482**, seal coat and b. conc. 166.997 mi. Hy. FM 601, US 180, FM 57, etc., Proj. C 107-3-5, C-295-2-8, etc., Shackelford, Borden, Fisher, Callahan, Jones, Howard, Taylor, Mitchell, Scurry and Kent Counties;

T. R. Vardeman & Son, P.O. Box 485, Nacogdoches, Tex. LB **$62,652**, foundation course, one course surf. tr. 2.74 mi. Hy. SH 7, Proj. S 1164 (3) Angelina Co.;

Wendel Constr. Co., P.O. Box 231, El Campo, Tex., LB **$131,753**, flexible base, one course surf. tr. 6.539 mi. Hy. FM 2031, Proj. S 428 (1), Matagorda Co. Bids May 19. CD 4/26, 4/28, 5/5.

▲† **E. E. Barber**, 722 Wheeler St., Fort Smith, Ark., LB, **$1,151,984**, relocating of 8 steel, concrete bridges for St. Louis Southwestern Ry. Co., due to Texarkana Reservoir Project, Serial No. CIVENG-16-047-54-186, TEXAS. U. S. Eng., foot of Prytania St., New Orleans 6, La. Bids May 14. CD 4/16.

† **Steinberg & Son**, Box 1144, Dallas, Tex., CA **$844,215**, est. $500,000-$1,000,000 50-bed hospital, Inv. No. ENG-41-243-54-22, Laredo Air Force Base, LAREDO, TEX. U. S. Eng., Box 1229, Galveston, Tex. Bids May 18. CD 5/25, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Northern States Power Co.**, 16 S. Fifth St., Minneapolis, Minn. Own Forces. **$2,220,000**. 160x190 ft. Merriam Park SUB-STATION, Snelling and Randolph Aves., ST. PAUL, MINN.

▲ **MacDonald Constr. Co.**, 1310 S. Grand Blvd., St. Louis 4, Mo. CA **$4,321,000**, general contract;

Tobin Brothers, Inc., 708 N. Adams St., Peoria, Ill. CA **$643,000**, plumbing contract;

Kremer-Hicks Co., 3974 Delmar Blvd., St. Louis 8, Mo. CA **$846,000**, heating contract for HOUSING Proj. Mo-1-7 Phase 1 consisting of 660 dwelling units in four 9 story, bldgs., on 16 acres area bounded by Lafayette Ave. and Hickory, 12 and 14 Sts., Joseph M. Darst Apartments, ST. LOUIS, MO. St. Louis Housing Auth., John J. O'Toole, exec. dir., 901 Washington Ave., St. Louis 1, Mo. Bids Mar. 30, awarded May 21. CD 4/5, under LB.

Robert Paulis Constr. Co., 3441 Morganford Rd., St. Louis 16, Mo. CA **$802,090**, brick, rein.-con., steel elementary SCHOOL, 1925 Cass Ave. to serve M-1-5 housing area, ST. LOUIS, MO. Bd. Educ., V. Harry Rhodes, comr. School Bldgs., 911 Locust St., St. Louis 1, Mo. CD 5/20, under LB.

▲ **Manhattan Constr. Co.**, Muskogee, Okla., CA, **$1,500,000**, 1 story, 240,000 sq. ft. grocery WAREHOUSE with heating, ventilating, air-conditioning, and sprinkler systems, 1 story, 73,000 sq. ft. perishable goods WAREHOUSE, 1 story, 6,000 sq. ft. TRUCK REPAIR SHOP, LITTLE ROCK, ARK. Safeway Stores, Inc., 216 Collins St., Little Rock, Ark. Ginocchio-Cromwell & Assocs., Hall Bldg., Little Rock, Ark., archts. Bids Apr. 20. CD 4/1.

▲ **Sandy Hawthorne**, 2475 Gladys St. and Willis G. Thames, 3220 French Dr., Beaumont, Tex., Own Forces, **$651,000**, 41 stone, brick DWELLINGS;

G. Sargi, Kyle Bldg., Beaumont, Tex., CA, **$467,335**, 32 DWELLINGS; CA **$347,000**, 25 brick, DWELLINGS, BEAUMONT, TEX. CD 9/16.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
June 17, California
STREETS AND ROADS
June 16, 17 California

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Cherf Brothers, Inc. & Sandkay Contractors, Inc.**, Ephrata, Wash., LB, **$1,676,547**, est. $2,117,23[illegible] earthwork, pipe lines and structures, incl. 13 pumping plants for Area E-6 (Block 45) lateral, sublatera[illegible] wasteways and drains East Low Canal Laterals, Columbia Basin Proj., Spec. DC 4151 WASHINGTON. Bureau Reclamation, Dpt. Interior, Ephrata, Wash. Bids May 20. CD 4/6.

† **Baker & Ford**, Bellingham, Wash., LB, **$932,176** 181x242 ft., rein.-con. addn. to aircraft maintenance hangar, at Ault Field, Spec. 20849, WHIDBEY ISLAND, WASH. P. Wks. Officer, Thirteenth Naval District, 1611 W. Wheeler St., Seattle, Wash. Bids May 20. CD 4/28.

CALIFORNIA—State Div. Hys., Los Angeles,

Peter Kiewit Sons' Co., 345 Kieways Ave., Arcadia, Calif., CA, **$906,235**, grading, paving, 3 bridges 1 mi. in Los Angeles and Pasadena, Los Angeles Co. Bids Apr. 29, awarded May 17. CD 5/12, under LB.

▲ **Paul Hardman, Inc.**, 10955 W. Pico Blvd., Los Angeles, Calif., CA, **$1,054,140**, 30 mi. aviation fuel pipe line to El Toro Marine Base, NOY 74102, Spec. 35137. CALIFORNIA Dpt. Navy, San Diego, Calif. Bids Feb. 18, awarded May 17. CD 3/1, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Mountain Home Development Corp.**, Mountain Home, Idaho, LB, **$4,982,183**, construct, manage and maintenance 500-unit rental HOUSING, MOUNTAIN HOME, IDAHO. Dpt. Army, Contracting Officer, Air Force Base, Mountain Home, Idaho. Bids May 18. CD 5/12.

▲ **James I. Barnes**, 940 Spring St., Redwood City, Calif., CA, **$1,203,700**, 4 story, rein.-con. HOSPITAL addn. BAKERSFIELD, CALIF. Mercy Hospital, 2215 Truxton Ave., Bakersfield, Calif. Bids Apr. 30, awarded May 20. CD 5/11, under LB.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Fraser River Pile Driving Co.**, New Westminister, B. C. CA, **$1,244,254**, 1,500 ft. city docks addns. NEW WESTMINISTER, B. C. New Westminister, Harbor Bd., New Westminister, B. C. CD 5/13, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Smith Brothers & Wilson Ltd.**, 1267 Richards St., Vancouver, B. C., LB, Est. **$9,000,000-$10,000,000**. POST OFFICE, VANCOUVER, B. C. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids May 17. CD 1/25.

Drolet Constr. Ltd., P.O. Box 99, Noranda, Que., CA, **$900,000**, COURT HOUSE, Mercier St., ROUYN, QUE. Province of Quebec, Quebec City, Que. Maurice Girard, 55 Main St., Rouyn, Que., archt.

▲ **Harvey S. Maron**, 4719 Circle Rd., Montreal, Que., Owner Builds, **$4,450,000**, 500-unit HOUSING, Monte St., Leonard between Ajilda St. and Metropolitan Blvd., ST. LEONARD DE PORT MAURICE, QUE.

▲ **W. C. Wells Constr. Co., Ltd.**, 140 Ave. N., Saskatoon, Sask., CA, **$1,277,733**, 3 story, L shaped, 225x140x275 ft., brick, tile TELEPHONE bldg., First Ave. between 22 and 23 Sts., SASKATOON, SASK. Saskatchewan Govt. Telephone, Regina, Sask. Stock, Ramsay & Assocs., 1745 Scarth St., Regina, Sask., archts.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Mason, Osberg, Scheumann & Johnson**, 5209 E. Marginal Way, Seattle, Wash., LB **$4,473,161**, est. $3,797,192, docking facilities, Inv. 54-100, Whittier, Alaska. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids May 25.

U. S. POSSESSIONS

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Tecon Corp.**, 1201 Main St., Dallas, Tex., CA, **$3,391,000**, blasting sect. of Contractor's Hill, Gaillard Cut, PANAMA CANAL, Panama Canal Co., 101 Indiana Ave. N. W., Wash. 25, D. C.

(Proposal Advertisements see pp 96 to 98)

Bid on treatment building wins Ohio water plant job

Charles H. Shook Co., Dayton, contracted to build a $1,322,000 supplementary lime-soda water softening plant for the city of Hamilton, Ohio, 2% under the second low bid. Total difference between the two low bidders was $32,486. Their gap in treatment plant building prices was $31,000. Alfred LeFeber & Assoc., Cincinnati, are consulting engineers for the project.

Bidding was on a lump sum basis with labor and materials breakdown given for each item. Although labor accounted for only 29% of his total bid, Penker Const. Co., Cincinnati, placed second of 12 in the contest. Labor accounts for 47% of Shook's bid.

The plant has a nominal capacity of 6 mgd. Its design allows for a near future capacity of 12 mgd with ultimate capacity in the far future at 18 mgd. (1950 population of Hamilton was 58,000).

The treatment plant building will be constructed of reinforced concrete, steel and brick. The water treating tanks will be reinforced concrete. Duplicate treating tanks are provided of the high rate type and are square in plan. Ahead of the units are multicone aerators, with two recarbonation chambers following the units.

Four 1.5 mgd double filters of the central gullet type are housed in the filter wing. The filters have the Wheeler type filter bottoms and are equipped with surface wash. The filters are backwashed from an elevated tank. Clearwell storage is below the filters and wet well storage below the pump room. High service pumps of the vertical turbine type take suction from the wet well.

Two gravimetric feeder-slaker units are provided for feeding lime, one gravimetric feeder for alum, and one for feeding soda ash. Chemicals will be received in bulk by truck, to unload into receiving hoppers with the chemicals lifted by pneumatic conveyor to four concrete storage bins located above the feeder room.

The building contains laboratory and office facilities, together with shop, toilet and shower rooms.

Prevailing wage rates in the Cincinnati area are: $2.925 per hr for carpenters, $3.12 for electrical workers, $2.02 common labor.

The work must be completed within 600 calendar days.

Bidders include:

1C Chas. H. Shook Co., Dayton, Ohio	$1,322,285
2 Penker Const. Co., Cincinnati, Ohio	1,354,771
12 Nasser Const. Co., Freemont, Ohio	1,590,700

Bids: 3-9-54 Item	1C Lump sum	1C % for labor	2 Lump sum	2 % for labor
Outfall sewer	$11,520	43.6	$17,000	47.1
Outside sew & drains	15,200	44.1	20,000	50.0
Out water & gas piping, val	53,800	37.7	54,000	37.0
Treatmnt plant bldg	526,000	68.6	557,000	35.9
Inside piping & valves:				
pipe, fittings & coupigs	81,800	30.9	80,000	25.0
gate valves	19,760	9.9	21,000	14.3
filter valves	19,840	9.8	21,000	14.3
cone check valves	18,530	1.8	19,000	10.5
check valves	410	26.8	500	20.0
surge relief valves	970	17.5	1,500	20.0
air release valve	60	50.0	100	20.0
Pumps:				
high service (3)	25,500	7.8	25,424	5.6
washwater (1)	1,570	17.2	1,551	9.7
sludge (3)	1,470	18.4	2,112	14.8
duplex sump (1)	970	17.5	834	4.1
Filter equip (4 filters :				
underdrains	17,000	50.0	11,000	18.2
media	8,640	43.2	7,000	28.6
washwater troughs	4,240	24.5	4,000	25.0
rate controllers	9,720	4.3	10,000	10.0
loss of head & rate of flow gauges	3,880	30.4	4,000	12.5
operating tables	7,070	18.0	12,000	8.3
filter bed agitators	8,440	27.3	7,000	14.3
Calgon feeder equip	1,030	27.2	1,000	10.0
Chem feeder & lime slakers	29,650	12.3	31,000	3.2
Fluor equip	5,810	12.2	5,000	10.0
Bin agitators	3,170	30.6	3,000	16.7
Air compressor	1,970	18.8	3,000	6.7
Chlorin equip	5,390	10.9	6,000	16.7
Washwater control & guage	4,565	12.4	6,000	16.7
Gauges:				
clearwell depth	960	16.7	1,000	10.0
washwater tank level	1,225	26.5	900	5.6
west reservoir depth	760	21.1	800	6.3
east reservoir depth	415	27.7	400	12.5
high service pressure	720	30.6	600	8.3
Meters:				
raw water (2)	6,360	8.5	6,000	8.3
finished water	11,210	6.3	12,000	4.2
carbon dioxide (2)	2,195	13.4	2,000	10.0
washwater	540	16.7	500	10.0
plant service water	665	9.8	600	8.3
Elevator	15,800	43.0	12,000	4.2
Crane & hoists:				
travel crane & hoist	4,500	37.8	3,900	5.1
shop hoist	550	45.5	500	10.0
Pneumatic conveyor	20,925	14.0	22,000	9.1
Aerators (2)	12,190	9.8	11,000	9.1
Water treat tanks	61,000	56.6	80,000	50.0
Water treat equip	111,280	16.4	111,000	10.0
Carbonation equip	10,845	9.6	12,000	16.7
Plumbing	20,000	55.0	20,000	50.0
Heating	27,000	55.6	25,000	40.0
Electrical work	72,000	61.1	60,000	33.3
Painting	13,800	63.8	11,000	45.5
Driveways, walks & culv	7,500	53.3	5,000	20.0
Grading & seeding	9,900	71.7	6,000	83.3
Fndn for washwater tank	1,750	65.7	4,000	25.0
Lab & office equip	5,500	9.1	5,500	9.1
Extra excavation—100 cy	170	64.7	500	90.0
Extra cl 1 concrete—100 cy	4,300	62.8	3,000	50.0
Extra cl 2 concrete—100 cy	4,100	65.9	3,000	50.0
Extra cl 3 concrete—100 cy	1,520	53.9	3,000	50.0
Extra reinf steel—5,000 lb	550	36.4	750	33.3
Sheeting left in pl—10 Mbm	3,200	65.6	200	5.0
Slag refill—100 cy	680	50.0	600	16.7

In order to use comparable total bids, the following prices were excluded from previous mentions of second low bid:

	1C	2	
Washwater tank	No bid	$18,700	30.5
Cathodic prot, insp maint & service	No bid	600	91.7

The washwater tank was let under separate contract to Pittsburgh-Des Moines Steel Co. for $26,240. This amount, plus the $1,322,285 of Shook's contract, brings the total cost of the new Hamilton water treatment plant to $1,348,525. The engineer's estimate for the complete job was $1,408,000, or 4% higher.

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Contractors break all records in 1953

Number of firms, volume of business, and number of projects reach new highs. But increase is leveling off

ENR's annual contractor count shows that contractors who took on $100,000 or more of new business broke three records in 1953:

- There was a record number of contractors—7,664.
- Total new business set a record of $10.9 billion.
- Total number of new projects also set a record of 16,523.

That, in broad strokes, is the picture presented by ENR's annual contractor count. It shows construction rolling along in high gear, but gaining much more slowly than it did in 1952. Last year the number of contractors gained 3%, as compared with a 10% gain in 1952. Total dollar volume gained 2%, as compared with 12%.

Because there were 7% more projects reported in 1953 than in 1952, in terms of dollars, the size of the average project taken on by contractors in 1953 was smaller than the year before—$658,000 as compared with $695,000. However, this is caused by awards of more than $2 billion in atomic energy contracts during 1952, which distorts the average for that year. Taking out these AEC jobs would make the average 1953 contract higher than in 1952.

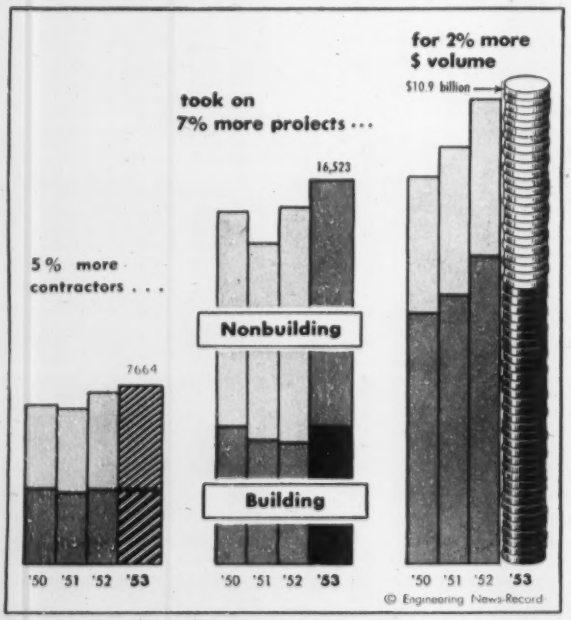
• Competition starts to take hold—This slowdown shows that increasing competition was beginning to have some effect in 1953. However, it is interesting to note that the sharp (69%) drop in federal construction contracts during 1953 did not have any serious effect on the total number of contractors engaged in work where the federal government is the major client. There was a 17% drop in the total number of contractors doing airport work, but the total number of contractors engaged on earthwork and irrigation contracts even increased slightly.

But tighter competition seems to have played its part in reducing numbers of contractors engaged in highway work. The total number of highway contractors declined 2%, although total value of contracts climbed 28%.

The decline in federal work may be why there was a slightly bigger increase during 1953 in the number of building contractors than for nonbuilding firms. The gain for the building firms was 4%, as compared with 3% for nonbuilders. This trend differs from 1952, when building contractors had increased much less than the nonbuilding contractors. Much of the gain among building contractors was caused by a 17% increase in the firms doing industrial work.

• More firms—The number of firms increased pretty much all along the line, but there are some interesting changes of pattern. In the group of million-dollar-plus contractors, the nonbuilding contractors increased more than the building contractors, following the pattern set in 1952. They also signed up 38% more business than in 1952, compared with a 14% drop in dollar volume for the building contractors. However, this 14% decline was due entirely to the atomic energy contracts let in 1952.

• Change of pattern—But when you go down to the next group—the contractors who did from $500,000 to $1,000,000 of new business—you notice a difference. There is a 2% decline among nonbuilding contractors, while the number of building contractors gained 3%. Volume of business taken on by contractors in this group follows somewhat the same pattern. It is up 7% for builders, up only 3% for nonbuilders. In 1952, the number of nonbuilding contractors in this group increased much faster than the building contractors, and their business also increased more.



How 7,664 contractors taking on $100,000 or more in '53 contracts divided 16,523 projects costing $10.9 billion

Type of Work	Number of . . . contractors 1953	% Change from '52	projects 1953	% Change from '52	$ Volume (millions) 1953	% Change from '52
Nonbuilding						
Waterworks	599	+ 9	975	+23	$223	+16
Sewerage	819	+22	1275	+29	$390	+51
Bridges	670	+16	1015	+22	$679	+107
Streets, roads	2036	− 2	4803	− 2	$1639	+28
Earthwork, irr	458	+0.4	652	+ 3	$373	−19
Airports	650	−17	901	−22	$497	−19
Unclassified	708	+ 9	919	+17	$801	+68
Total	4318	+ 3	10540	+ 5	$4602	+28
Building						
Industrial buildings	1335	+ 7	2135	+12	$2593	+ 3
Mass housing, commercial and public building	2507	+ 3	3848	+14	$3675	−20
Total	3346	+ 4	5983	+13	$6268	−11
All construction	7664	+ 3	16523	+ 7	$10870	+ 2

The same reversal happens in the $100,000-$500,000 bracket. In 1952, the number of nonbuilding contractors increased 16%, while the number of building contractors remained the same. Business taken on by nonbuilders also increased much faster than for building contractors. But in 1953, the number of building firms gained 7%, while nonbuilding contractors gained only 3%.

• **Million-dollar firms**—The million-dollar-plus contractors did much better than the other groups in sewerage, bridges, and highways. Their numbers increased faster and they handled a much bigger increase in volume than the smaller firms. Where highways are concerned, this million-dollar-plus group was the only one to have more firms doing highway work than in 1953, and the only group to do more dollar volume.

Firms in the $100,000-$500,000 bracket increased their share of waterworks business in 1953, with 15% more firms signing up 27% more contract volume. This group also has come up with a bigger share of new earthwork and waterways contracts. On the other hand, fewer of the firms in the other two groups handled earthwork and waterways in 1953 and their dollar volume dropped sharply. Earthwork and waterways contracts are heavily dominated by the federal government. In another primarily federal category—airports—new business was lower for all groups, but the $100,000-$500,000 firms came off best.

• **Dollar volume per contractor**—For contractors of all types, average dollar volume declined 2% for the million-dollar-plus contractors, and was up 5% for the medium-size firms. Companies in the $100,000-$500,000 group had practically the same average dollar volume as in the previous year.

There was a dramatic jump of 31% in average volume among the million-dollar-plus firms doing nonbuilding work. Medium-size firms of this type showed a 5% average increase, while the firms doing from $100,000 to $500,000 of business increased only 1%, on the average.

For large building contractors, the huge atomic energy contracts let in 1952 distort any comparison with volume in 1953. So there was a 16% decline in average volume per firm in 1953. Building contractors in the middle group averaged 4% more volume, while the firms in the $100,000-$500,000 class stayed about the same.

• **Average project**—The average nonbuilding project was $437,000 in 1953, a sharp gain from the $358,000 average in the previous year and also above the $400,000 average for 1951. Total dollar volume of these projects was up 28%, while the number of projects rose 17%. The million-dollar-plus contractors increased their share of total business taken on by all three groups to 76%, from 70% in 1952. Both the other groups got a smaller share of total business than in 1952. This was opposite to the 1952 trend.

The average building project was $1,048,000, considerably below the $1,336,000 average for 1952, which was swollen by atomic energy contractors. The number of building projects was up 13%, while dollar volume declined 11%. Perhaps because of the fact that there was only one sizable atomic energy contract awarded last year, the big building contractors' share of total business declined from 85% in 1952 to 81% in 1953, while the shares of the other two groups increased slightly. This also was directly against the trend in 1952.

• **Industrial contractors**—It's worth noting that the 1,335 firms which took on industrial contracts last year was the largest group on record—up 17% from the previous year. Though the 1951 record still stands where dol-

(*Continued on page 94*)

Contractor new business in 1953—by size of firm

Contractors who signed up $100,000 or more in heavy construction contracts during 1953, as reported by ENR

Total '53 volume of all types →	1. $1,000,000 or more						2. $500,000-$1,000,000						3. $100,000-$500,000					
	Number of . . .				$ Volume (millions)		Number of . . .				$ Volume (millions)		Number of . . .				$ Volume (millions)	
	contractors		projects				contractors		projects				contractors		projects			
Type of Work	1953	% Change from '52	1953	% Change from '52	1953	% Change from '52	1953	% Change from '52	1953	% Change from '52	1953	% Change from '52	1953	% Change from '52	1953	% Change from '52	1953	% Change from '52
Nonbuilding																		
Waterworks	168	+ 4	351	+31	$134	+11	92	− 2	164	+10	$33	+18	339	+15	460	+21	$56	+27
Sewerage	214	+28	392	+46	231	+82	160	+23	299	+27	$76	+27	445	+19	584	+20	83	+17
Bridges	299	+24	484	+37	581	+133	106	+25	177	+21	$44	+38	265	+ 6	354	+ 6	54	+15
Streets, roads	561	+ 7	2055	+ 3	1160	+49	384	−11	1022	− 7	$233	− 5	1091	− 4	1726	− 4	246	− 5
Earthwork, in	190	− 2	278	− 5	315	−20	68	−12	105	− 5	$24	−25	200	+ 8	269	+19	34	+ 3
Airports	284	−15	429	−28	388	−19	97	−25	148	−26	$51	−22	269	−15	324	−10	58	−11
Unclassified	231	− 2	331	+10	678	+79	109	+31	155	+31	$50	+43	368	+12	433	+19	73	+18
Total	1035	+ 5	4320	+ 6	$3487	+38	746	− 2	2070	+ 1	$511	+ 3	2537	+ 3	4150	+ 5	$604	+ 4
Building																		
Industrial buildings	501	+21	1049	+ 6	$2382	+ 2	222	+19	352	+28	$96	+30	612	+13	734	+13	$115	+13
Mass housing, commercial and public buildings	992	+ 5	2121	+23	$2970	−24	596	+ 2	793	+ 5	$392	+ 2	919	+ 2	934	+ 3	$313	+ 5
Total	1149	+ 2	3170	+17	$5352	−14	707	+ 3	1145	+11	$488	+ 7	1490	+ 7	1668	+ 7	$428	+ 7
All construction	2184	+ 3	7490	+10	$8839	+ 1	1453	0	3215	+ 4	$999	+ 5	4027	+ 4	5818	+ 6	$1032	+ 5

lar volume of industrial business and number of industrial contracts is concerned, 1953 was 3% ahead of 1952 on dollar volume and 12% ahead on number of projects.

It is interesting that the medium-size contractors and those in the $100,000-$500,000 group increased their industrial business much more than the big contractors. A large factor in this trend was the shift in emphasis during 1953 from big defense plants to increased work on non-defense expansion.

Total of contractor failures makes new postwar record

Close bidding brought on by tight competition for jobs has pushed contractor failures for the first four months of this year to a postwar high. Dun & Bradstreet reports that 430 contracting firms failed during this period, up 28% over 1953. Preliminary figures for the first three weeks of May show failures running 50% higher than a year ago.

This rise in failures confirms reports which started reaching ENR during 1953 that some less experienced contractors were bidding unrealistically on jobs. Other firms were bidding close to their breakeven point to keep forces together until the flow of new business picks up.

Specialty building subcontractors have suffered most from the price squeeze, judging from the rate of failures this year. Their failures are up 35% in the first four months. Liabilities of specialty building subcontractors average $315,000 per firm compared with $287,000 during the same period last year. Failures of general building contractors are 18% higher than last year, while total liabilities are up 51%. For nonbuilding contractors, failures are up 28%, but total liabilities are down 40%.

New ruling may speed up Pennsylvania school building

Some 125 school projects now on file with the state of Pennsylvania's Public Education Department may now get approval, under a new ruling by Attorney-General Frank F. Truscott. That is, they will if local school boards can finance lease payments. Usually the state pays about half the cost of the construction.

Truscott has modified an earlier ruling by his department that no new school building projects could be approved for construction by the Public Education Department, because a $425-million ceiling set by the 1953 legislature had been reached last December.

Now, Truscott says that state education officials can approve local school projects financed through revenue bonds, provided that such projects are wholly paid for by local school boards, which may contract either with the State Public School Building Authority or with a local municipal authority.

GE pushes heat pump sales in southern New Jersey

General Electric Co., one of the firms manufacturing heat pumps, is starting its first campaign on a large scale to sell heat pumps in a northern state. GE is collaborating with Atlantic City Electric Co. and with one of its local distributors to sell its "Weathertron" in southern New Jersey.

A year's test has been made in this area on operating costs of one of these units in a house with 1,700-sq ft floor space. The cost of electricity was 1.8 cents per kwh. Results: winter heating use was 11,200 kwh at a cost of $201; summer cooling used 3,900 kwh at a cost of $70.

Although installation cost is figured as about 15% to 35% higher than a fuel heating plant, General Electric figures that this is offset by the fact that it provides summer air conditioning without the necessity of putting in another appliance.

Business briefs . . .

• **800 new supermarkets**—that's the goal planned this year by members of the Super Market Institute. They also plan to remodel about 425 supermarkets.

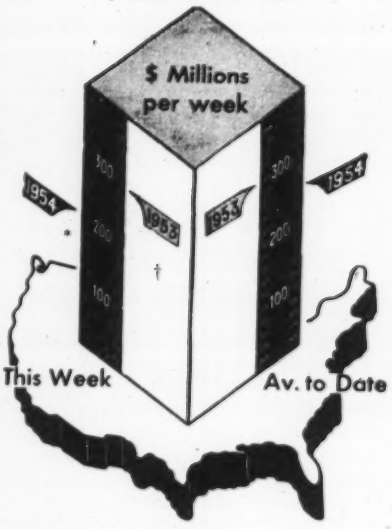
• **April shipments** of fabricated structural steel totaled 290,000 tons. That's the second highest figure for any month, in 25 years according to the American Institute of Steel Construction.

• **Trouble in corporate bond market** has led to postponement of a $25-million mortgage bond issue scheduled for this week by Consumers' Power Co., of Jackson, Mich. Corporate bond prices have been declining lately, and dealers still have some unsold bonds from previous utility issues.

• **More clay tile**—Verne W. Boget, chairman of the Tile Council of America, predicts an installed dollar volume of $275 million this year, up 10% from 1953.

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

	This Week*	Cumulative 22 wks 1954	1953	% chge
Federal	$30.3	$443.3	$642.1	−31
State and municipal	66.7	1,865.1	2,036.3	−8
Total pub.	97.0	2,308.4	2,678.4	−14
Total priv.	107.4	3,258.9	3,909.2	−17
U. S. total	**$204.4**	**$5,567.3**	**$6,587.6**	**−15**
Contracts by type of work				
Waterworks	$1.2	$98.8	$104.8	−6
Sewerage	3.4	154.7	172.2	−10
Bridges	3.1	152.5	253.1	−40
Highways	31.3	682.2	682.0	0
Earthwork, waterways	1.2	114.4	145.1	−21
Buildings:				
Public, excl. hsg.	27.9	686.4	713.5	−4
Housg., pub.	11.3	85.2	247.4	−66
Housg., priv.	51.8	1,795.1	1,743.9	+3
Commercial	11.2	522.3	477.2	+9
Industrial	38.0	815.1	1,355.5	−40
Unclassified	24.0	406.6	692.9	−34
Total	**$204.4**	**$5,569.3**	**$6,587.6**	**−15**

* 4-day week † 5-day week

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction
(millions of dollars)

	Week of May 20 1954	Cumulative 21 Wks 1954	% chge 1953-54
Corporate securities	$38.4	$1,233.4	−28
State and municipal:			
All except housing	80.3	2,318.6	+46
Housing	...	42.6	−77
Federal loans	1.4	50.2	−1
Federal aid	...	55.0	...
Total non-federal	**$120.1**	**$3,699.0**	**+5**
Federal approps.:			
In U. S.	...	56.0	...
Outside U. S.	...	4.6	...
Total new capital	**$120.1**	**$3,760.6**	**+6**

ENR indexes		Base years = 100 1913	1926	1949
Constr. cost	May '54	618.69	297.40	129.70
	Apr '54	615.36	295.80	129.00
Bldg. cost	May '54	438.69	237.14	124.70
	Apr '54	437.94	236.74	124.49
Volume	Apr '54	517	210	149
	Mar '54	426	173	123

NOTICE TO BIDDERS

SEALED BIDS will be received jointly by the Parish of Jefferson and the Parish of St. Tammany, State of Louisiana, at the Office of the Secretary of the Jefferson Parish Police Jury, in the Courthouse at Gretna Louisiana, until two (2:00) o'clock P. M., Central Standard Time, June 23, 1954, and immediately thereafter publicly opened and read, for the furnishing of all plant, labor, equipment, materials and other facilities, and all other things necessary and proper for and incidental to the construction of

(a) GREATER NEW ORLEANS EXPRESSWAY—Lake Pontchartrain Bridge, from Station 298 + 90 to Station 1570 + 68.5 including the substructures, superstructures, movable bascule spans, administration buildings, garages, toll booths, toll equipment, plazas, and all appurtenances; as described in plans and specifications prepared by Palmer and Baker, Inc., Consulting Engineers, and hereinafter referred to as Contract 65.

(b) GREATER NEW ORLEANS EXPRESSWAY—The Approaches—South Shore, Harlem Avenue—from Station 143 + 00 to Station 292 + 55.99, in Jefferson Parish, Louisiana, including bridges, drainage structures and ditches, and other improvements; as described in plans and specifications prepared by Palmer and Baker, Inc., Consulting Engineers, and hereinafter referred to as Contract 65-1.

(c) GREATER NEW ORLEANS EXPRESSWAY—The Approaches—North Shore—from Station 1570 + 68.5 to Stations 1664 + 23, 1714 + 72.87, and 117 + 08.95, to the east, north and west, respectively, in St. Tammany Parish, Louisiana, including bridges, drainage structures and ditches, and other improvements; as described in plans and specifications prepared by Palmer and Baker, Inc., Consulting Engineers, and hereinafter referred to as Contract 65-2.

Bids will be received only on all three foregoing items, namely, Contracts 65, 65-1 and 65-2, in combination. Bids on individual contracts or on any combination of two contracts will not be considered.

Plans and specifications may be examined at the aforesaid Office of the Secretary of the Jefferson Parish Police Jury, and also at the Office of the Secretary of the St. Tammany Parish Police Jury, in the Courthouse at Covington, Louisiana, and said plans and specifications may be examined and information obtained from Palmer and Baker, Inc., Room 427, National Bank of Commerce Building, New Orleans, La., or 957 Spring Hill Avenue, Mobile, Ala., (Post Office Box 346). Complete copies of the foregoing documents will be furnished to bona fide bidders upon a deposit of $250.00 per set for item (a), Contract 65; $100.00 per set for item (b), Contract 65-1; and $100.00 per set for item (c), Contract 65-2; respectively. The deposits, if a bid is made, will be remitted not later than thirty (30) days after the opening of bids, provided the documents are returned complete and in good condition.

Certified checks on a National Bank or a Louisiana State Bank in good standing and drawn to the order of "The Parish of Jefferson and the Parish of St. Tammany" in the following amounts must accompany each bid as a guarantee that the bidder, if successful, will enter into contract and make bond in accordance with the requirements of the specifications:

For item (a), Contract 65—$1,500,000.00;

For item (b), Contract 65-1—not less than five per cent (5%) of the total amount bid therefor; and

For item (c), Contract 65-2—not less than five per cent (5%) of the total amount bid therefor.

Bidder's bonds, Cashier's checks or currency will not be acceptable.

Attention is called to the fact that after bids are received hereunder revenue bonds will be offered for sale by said Parishes to finance the cost of the work, that the award of the work herein advertised will be contingent upon the sale and delivery of said revenue bonds, and that the obligations of said Parishes under the contracts thus awarded will be payable solely from the funds derived from the issuance and sale of such revenue bonds.

All bids shall be submitted in sealed envelopes bearing on the outside the name of the bidder, his address, and the designation of the work, "Greater New Orleans Expressway." If submitted by mail, the sealed envelope containing the bid, and marked as directed, shall be enclosed in another envelope addressed to:

Honorable Frank J. Deemer, Secretary, Jefferson Parish Police Jury.

and

Honorable L. L. Landon, Secretary, St. Tammany Parish Police Jury,
Post Office Box No. 109, Gretna, Louisiana.

The Parish of Jefferson and the Parish of St. Tammany reserve the right to reject any and all bids to waive informalities in any bid.

All bids will be retained by the Parish of Jefferson and the Parish of St. Tammany and none will be returned. No bids received later than the time specified for submission will be considered.

The Police Jury of the Parish of Jefferson and the Police Jury of the Parish of St. Tammany will meet in the Police Jury Room of the Courthouse at Gretna, Louisiana, on the date and at the time first hereinabove shown, and will then and there proceed to open and read said bids in joint public session.

For the
PARISH OF JEFFERSON, LOUISIANA

(s) FRANK J. DEEMER,
Secretary, Police Jury

For the
PARISH OF ST. TAMMANY, LOUISIANA

(s) L. L. LANDON,
Secretary, Police Jury

OFFICIAL PROPOSALS

Bids: June 10, 1954

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, Public Building Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced Standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 10th day of June 1954, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, N. F. Ronan, Asst. District Engineer, 353 Broadway, Albany, N. Y.						
Albany	FARC 54-6	Guilderland Center-Guilderland, S. H. 365. Schoharie Pts. 1 & 2, S.H. 177 Proj. S-427(1)	2.01	Asp. Conc. Optional	$7,000 Plans $10	$119,000
Saratoga	FGSH 54-10	Waterford-Mechanicville Pt. 3	0.78	9" Cem. Conc. Pavt. 14'-24' Wide=0.78 Mi.	$54,000	980,000
	FGC 54-3	Mechanicville City: South City Line to FAC 50-14 Proj. U-UG-319(3)	(0.58 Acc.)	Cem. Conc. Pavt. Conn. Rds.=0.58 Mi. R. R. Gr. Sep. Comp. I-beams 240'		
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica, N. Y.						
Herkimer, Oneida Montgomery	RC 54-68	Br. No. 1A, S. H. 5248; Br. No. 2A, S. H. 5248; Br. No. 1, S. H. 1805; Br. No. 1, S. H. 831-CA	....	Cleaning & Painting 4 Bridges	$1,300 Plans $10	22,000
DISTRICT No. 3, William Robinson, Weigh Lock Building, Syracuse, N. Y.						
Cayuga, Seneca, Onondaga	OT 54-2	New York State Thruway-Ontario Section-Subs. 1, 2, 3, 4, 5, 6, 7 & 8A (Ontario Co. Line-Brewerton Rd.) Mohawk Section Sub. 8B (Brewerton Rd.-Madison Co. Line)	47.79	Chain Link Fence=0.07 Mi. Cattle Fencing=7.71 Mi.	$2,600 Plans $10	48,000
	MT 54-1					
DISTRICT No. 5, C. R. Waters, District Engineer, 65 Court Street, Buffalo, N. Y.						
Cattaraugus	FAC 54-5	Salamanca City: Broad St. (West City Line-State	1.97	Asp. Conc. Ty. 2A=1.95 Mi.	$23,000	403,000
	FARC 54-65	Park Ave.) East Randolph-Salamanca Pt. 2, S. H. 8308 Proj. U-356(5) Cont.#1		Misc. Work=0.02 Mi.	Plans $15	
Erie	FASG 54-10	Walden Ave.-Ellicott Road R. C. 318 Proj. SG-380(2)	0.09	Asp. Conc. Opt. R. R. Sep. Comp. I-beam 93.2	$5,500 Plans $10	100,000
Erie	FASS 54-9	Duerr Road, C. R. 463 and Thorne Street, C. R. 136 Proj. S-330(1)	1.46	Asp. Conc. Opt.=1.40 Mi. Misc. Work=0.06 Mi.	$8,500 Plans $10	155,000
DISTRICT No. 6, J. H. Thomas, District Engineer, State Office Building, Hornell, N. Y.						
Allegany, Chemung, Tioga and Yates	RC 54-67	Various Highways (Tree Removal)	....	Removal of 214 Trees	$700 Plans $10	12,000
Steuben	FGRC 54-69	D. L. & W. R. R. Separation of Grades with Wayland-Dansville Pt. 1, S. H. 1292 Proj. FG-510(3)	0.05	Asp. Conc. Opt.=0.02 Mi. Misc. Work=0.03 Mi. Alter, Exist. R. R. Sep. Comp. I-beam 49'	$4,500 Plans $10	79,000
DISTRICT No. 9, F. W. Donovan, District Engineer, 71 Frederick St., Binghamton 21F, N. Y.						
Schoharie	RC 54-66	Various Highways (Tree Removal)	....	Removal of 111 Trees	$750 Plans $10	13,000
DISTRICT No. 10, M. E. Goul, District Engineer, Montauk Highway at Little East Neck Rd., Babylon, L. I., N. Y.						
Bronx	FAMDE 54-2	Major Deegan Expressway Extension (Cont. 8A) Proj. U-1082(20)	0.55	Sheet Asp. Pavt.=0.43 Mi. Misc. Work=0.12 Mi. Alterations I. R. T. El. R. R. Alterations to Van Cortland Park Utilities	$48,000 Plans $25	805,000
Bronx	FAMDE 54-4	Major Deegan Expressway, Contract 5B Proj. U-UI-UG-1082(19)	1.58	9" Cem. Conc. Pavt. 2 @ 36' Wide & Misc. Work=0.82 Mi. Sheet Asp. Pavt.=0.76 Mi. 1 Hy. Sep. Comp.° I-beam 145.3' 1 R. R. Sep. Comp. I-beam (Superst.) 145.4'	$158,000 Plans $50	2,863,000
Nassau	FGSH 54-11	Horace Harding Expressway Extension (North Service Road) (Cont. #1) Proj. UG-862(2)	0.51	8" Cem. Conc. Pavt. 24' Var. Wide=0.31 Mi. Misc. Work=0.20 Mi. R. R. Sep. Plate Girder 213.3'	$50,000 Plans $15	874,000
Suffolk	B. P. 54-33A & 50A	Moriches Inlet	0.38	Extension of East & West Stone Jetties and Erection of Light Tower	5% of Bid Plans $10	323,200

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

Bids: June 15, 1954

Construction of Road

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Department for:

VALLEY ROAD

Construction of Valley Road from Main Street to Morristown Road, Passaic Township, Morris County, Federal Aid Secondary Project No. S-136(2). Length 1.043 miles. The principal items of construction are:

Estimated:
- 9,052 cu. yds. Roadway Excavation
- 15,225 sq. yds. 5" Macadam Base Course
- 15,225 sq. yds. 3" Modified Penetration Macadam
- 1,708 tons Bituminous Concrete
- 804 lin. ft. Drainage

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey on Tuesday, June 15, 1954, at ten o'clock (10:00 A.M.—EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

NOTE: The proposed project is a "Federal Aid Secondary Project" authorized by the provisions of Title 27 of the Revised Statutes of New Jersey and supplements and by P.L. 769, 81st Congress, and is to be performed in accordance with the special provisions and requirements of the Bureau of Public Roads, Department of Commerce, as outlined in the specifications, which provisions require that labor be employed from lists furnished by the New Jersey State Employment Service, 30 Speedwell Avenue, Morristown, New Jersey. The attention of bidders is directed to the special provisions covering subletting or assigning the contract. The minimum wage paid to all common labor employed on this contract shall be $0.75 per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be $1.00 per hour. The minimum wage paid to all skilled labor employed on this contract shall be $1.50 per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, New Jersey, and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway Specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed:
STATE HIGHWAY DEPARTMENT
A. Lee Grover, Chief Clerk

OFFICIAL PROPOSALS

Water Works

"Bids Asked—Waterworks Minn. Hopkins 1 million gal. steel res. B. A. 7/6. W. R. L. Taylor, City Mgr, Hopkins, Minn."

Bids: June 22, 1954

Refuse Disposal Plant

ADVERTISEMENT FOR BIDS
TOWN OF BABYLON, SUFFOLK COUNTY, L. I.
NOTICE TO CONTRACTORS

Sealed bids for the construction of all Divisions of a Refuse Disposal Plant Project for the Town of Babylon in the County of Suffolk, New York, will be received by the Town Board at the office of the Town Board, Town Hall, Babylon, New York until 10:30 A.M. o'clock, Eastern Standard Time, June 22, 1954, and will then be publicly opened and read aloud at a meeting of the Town Board of the Town of Babylon.

The information for Bidders, Form of Bid, Form of Contract, Form of Performance Bond, General Conditions, Specifications, and the Contract Drawings may be examined at the office of the Town Clerk, Town Hall, Babylon, New York, or at the offices of the Consulting Engineer, Henry W. Taylor, 151 West Merrick Road, Freeport, New York, and copies thereof can be obtained upon the payment of a deposit of $25.00 for each set. The full deposit will be returned to any person submitting a proposal in accordance herewith and returning one copy of the plans and specifications in good condition within thirty days following the award of contract or rejection of the bid of such person; a refund of $10.00 will be made for any other sets of plans and specifications returned in good condition within thirty days following award of contract or rejection of bid covered by such plans.

Checks for deposits on Plans and Specifications shall be made payable to the Town of Babylon.

The Town of Babylon reserves the right to waive any informalities and to accept any bid or to reject any or all bids.

Each bidder must deposit, with his bid, cash or a certified check in an amount of not less than five percentum (5%) of the base bid, made payable to the Town of Babylon.

No bidder may withdraw his bid after acceptance thereof by the Town of Babylon, or within forty-five (45) days after the actual date of the opening thereof.

TOWN OF BABYLON
BY: ROWLAND SCOTT
Town Clerk

Dated May 25, 1954

Bids: June 9, 1954

Contract No. 1385

WASHINGTON SUBURBAN SANITARY COMMISSION
FURNISHING AND DELIVERING CRAWLER BACKHOE SHOVELS

Sealed proposals for furnishing and delivering two (2) ½ cubic yard backhoe and one (1) 30-foot interchangeable crane boom for above will be received in the office of the Acting Purchasing Agent, Room G-11, of the Washington Suburban Sanitary Commission, 4017 Hamilton Street, Hyattsville, Maryland until 10:30 A. M. Eastern Daylight Saving Time on Wednesday, June 9th, 1954 at which time and place they will be publicly opened and read.

Specifications may be obtained from S. Z. Salsberry, Acting Purchasing Agent of the Commission, Hyattsville, Maryland.

Raymond W. Bellamy, Chairman
L. S. Ray
J. Norman Ager
Commissioners

ATTEST:
James B. Parkhill
Secretary-Treasurer

U. S. Government

BIDS FOR CONSTRUCTION OF STEEL OIL BARGES—Memphis District, Corps of Engineers, U. S. Army, P. O. Box 97, Memphis 1, Tenn. Sealed bids will be received at this office until 11:00 a.m., C.S.T., 10 June 1954, and then publicly opened for construction of six steel oil barges. Information on request.

OFFICIAL PROPOSALS

Bids: June 10, 1954

Soil Explorations and Foundation Investigations

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 A.M., Eastern Daylight Saving Time, on June 10, 1954 by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y. for

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON THE ROUTE 17 EXPRESSWAY, BRIDGEVILLE TO FERNDALE, SULLIVAN COUNTY, WHICH CONSTITUTES CONTRACT NO. SPEC. SM-68

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York
(b) Mr. F. W. Donovan, District Engineer, 71 Frederick Street, Binghamton, New York
(c) Mr. Charles Schaefer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. A refund in full will be made to bidders for return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

The Engineer's estimate of cost for this work is $37,300.00.

Proposal for this contract must be submitted in a separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1865.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instruction to Bidders".

The right is reserved to reject any or all bids.

B. D. Tallamy
SUPERINTENDENT OF PUBLIC WORKS

Bids: June 29, 1954

Construction of Land Section

THE PORT OF NEW YORK AUTHORITY
LINCOLN TUNNEL
THIRD TUBE
NEW JERSEY LAND SECTION
CONTRACT LT-160.009

Sealed proposals for the construction of the New Jersey Land Section for the Third Tube of the Lincoln Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 29, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Contract Engineer of the Authority, Room 1112. Documents will be furnished upon deposit of $100.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $100.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 719, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Contract Engineer, who will furnish the documents.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, May 28, 1954

OFFICIAL PROPOSALS

Bids: June 17, 1954

Furnishing Material and Constructing Railroad Avenue Extension No. 2

ADVERTISEMENT—NOTICE TO CONTRACTORS
PROPOSAL FOR FURNISHING MATERIAL AND CONSTRUCTING RAILROAD AVENUE EXTENSION NO. 2
TO THE
ALBANY-SCHENECTADY ROAD SEWER DISTRICT
COLONIE, NEW YORK

Sealed proposals will be received at the office of the Town Board of the Town of Colonie, New York at the Town Hall, Newtonville, New York, on the 17th day of June, 1954 until 7:30 P.M., Eastern Daylight Saving Time, for furnishing material and constructing Railroad Avenue Extension No. 2 to the Albany-Schenectady Road Sewer District, and at said office publicly opened and read aloud.

The work will consist of furnishing and installing about 4,200 feet of vitrified pipe sewers; 3,150 feet of 10 inch vitrified pipe sewers, 200 feet of 12 inch vitrified pipe sewers, about 870 feet of 8 inch vitrified pipe sewers; and about 300 feet of 8 and 10 inch cast iron pipe under railroad crossings, and connecting force main with sewage pumping station, additions, manholes, connections to existing sewers, wyes and tees.

The Information for Bidders, Form of Contract, Plans, Specifications and Form of Performance Bond may be examined at the office of the Town Clerk, Town Hall, Newtonville, New York and at the office of Keis & Holroyd, Engineers, 257 Broadway, Troy, New York. Copies thereof may be obtained at the office of Keis & Holroyd upon payment of $25.00 for each set. Any bidder upon returning such plans and specification book will be refunded his payment and any non-bidder upon so returning such set within 30 days in good condition will be refunded $20.00.

The Town Board of Colonie, New York reserves the right to waive any informalities in, or to reject any, or all bids.

A certified check made payable to the order of the Supervisor of the Town of Colonie, New York, in the amount of 5% of the bid must be deposited by each bidder with his bid as a guarantee that in case the contract is awarded to him, that he will, within 5 days thereafter, execute such contract and furnish a satisfactory performance bond. On failure to do so he shall forfeit the deposit as liquidated damages, and acceptance of the bid will be contingent upon the fulfillment of this requirement by the bidder.

The successful bidder will be required to furnish a performance bond satisfactory to the Town Board of the Town of Colonie, New York, in the amount of the contract, and having as surety thereon such surety company or companies as are acceptable to the Town Board of Colonie, New York.

No bidder may withdraw his bid within 30 days after the date set for the opening thereof. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof.

HAROLD R. McCABE, Town Clerk
Dated: May 22, 1954
KEIS & HOLROYD
Engineers
Troy, New York

Bids: June 9, 1954

Contract No. 1386

WASHINGTON SUBURBAN SANITARY COMMISSION
FURNISHING AND DELIVERING CRAWLER TYPE LOADER

Sealed proposals for furnishing and delivering one (1) crawler type loader will be received in the office of the Acting Purchasing Agent, Room G-11, of the Washington Suburban Sanitary Commission, 4017 Hamilton Street, Hyattsville, Maryland until 11:00 A. M. Eastern Daylight Saving Time on Wednesday, June 9th, 1954 at which time and place they will be publicly opened and read.

Specifications may be obtained from S. Z. Salsberry, Acting Purchasing Agent of the Commission, Hyattsville, Maryland.

Raymond W. Bellamy, Chairman
L. S. Ray
J. Norman Ager
Commissioners

ATTEST:
James B. Parkhill
Secretary-Treasurer

OFFICIAL PROPOSALS

Bids: June 15, 1954

Construction of Steel Pipe Lines

City of Richmond, Virginia

Sealed Proposals will be received at the office of the City Purchasing Agent, 4th floor, Mosque Building, Laurel and Main Streets, Richmond, Virginia, until but not later than 11 o'clock A.M., E.S.T. June 15, 1954, at which time they will be publicly opened and read aloud, for the following work which may be awarded in whole or in part:

Location: From Brander Street on the south bank, north of the proposed sewage treatment plant site, under the James River to a location near the City Lock, in the City of Richmond, Virginia.

Type of Work: The work to be done is part of the Sewage Disposal Project, is entitled "Division A—City Lock River Crossing", and comprises the construction of two parallel 66-inch subaqueous reinforced concrete or steel pipe lines, totalling approximately 2,100 linear feet, under a channel approximately 7-feet deep.

The Proposal must be submitted on the proposal forms included in the Contract Documents.

Each Proposal must be accompanied by a certified or cashier's check made payable to the City of Richmond, equal to 5% of the amount of the Proposal, or bid bond equal to 6% of the amount of the Proposal, or be covered by an annual bid bond in the amount of at least 6% of the Proposal.

The Proposal Guaranty is required as an evidence of good faith and as a guaranty that, if the Proposal of bidder is accepted, the bidder will enter into the formal written Contract and furnish satisfactory Performance Bond. Check will be forfeited or bid bond will become due and payable if the bidder whose Proposal is accepted fails to furnish the required Performance Bond, or fails to execute a formal written Contract. Check of successful bidder will be returned after the Contract is executed.

The Bureau of Purchases reserves the right to waive any informality in bids.

The Contract may be awarded by the Purchasing Agent to the lowest responsible bidder, who shall be determined in accordance with rules and regulations governing purchases or contracts adopted and established by the Council and in accordance with and pursuant to sections 5.09, 5.11 and 12.07 of the City Charter.

The City Council shall have the power to authorize the Purchasing Agent to reject any or all bids, to re-advertise for bids, or to make the purchase or contract in the open market either after the rejection of all bids or before competitive bids have been requested.

The unit prices bid will be carefully examined and compared with current values before recommending the award of the Contract. If in the opinion of the Director the unit prices submitted are substantially over or under accepted current values, it will be deemed sufficient reason to recommend rejection of the bid, and further to recommend the award of the Contract to another responsible bidder. In case of error in the extension of a price in the bid, the unit price shall govern.

Attention is directed to Chapter 7 of Title 54 of the Code of Virginia of 1950. The act requires all contractors and subcontractors bidding on any project where the cost of the undertaking of the bidder is $20,000.00 or more, to register with and obtain a certificate from the State Registration Board for Contractors. Bids from contractors not complying with this law will not be considered. Anyone bidding as a general contractor whose bid includes sub bids amounting separately to $20,000.00 or more is required to obtain evidence from such subcontractors that they have complied with the law.

Any contractor submitting a bid on this project amounting to $20,000.00 or more, must insert the following statement in his bid over his signature: "Registered as a contractor under Chapter 7 of Title 54 of the Code of Virginia of 1950. Certificate No. ....., 19....."

Bidders must enclose with their Proposals, in a separate sealed envelope, complete information as to experience, equipment and financial condition on the form provided. Failure to submit this statement will constitute basis for rejection of the bid.

The Proposal, Instructions to Bidders, Contract, Performance Bond, Instructions to the Contractor, Specifications, Plans, and other Contract Documents may be examined at the office of the Director of the Department of Public Works, 217 Governor Street, Richmond, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of the Contract Documents may be obtained from the Director or the Engineers upon deposit of Twenty-five Dollars for each set, to be refunded upon the return of such set in good condition within 10 days after the opening of bids.

The Director reserves and shall have the right before award of contract to determine which of the two alternate pipe materials will be selected for Division A—City Lock River Crossing, and the award of contract will be made by the Bureau of Purchases to a responsible bidder based upon the type of material selected.

It shall be understood that all documents referred to in this Notice to Bidders shall be carefully examined and read and are all hereby made a part of the Proposal.

J. W. HUFFMAN,
City Purchasing Agent

Bids: June 16, 1954

Construction of Superstructure

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
DEPARTMENT OF ADMINISTRATION
DIVISION OF PURCHASES
NOTICE TO BRIDGE CONTRACTORS

Sealed Proposals addressed to the Division of Purchases and enclosed in an envelope endorsed "Proposal for the construction of the superstructure of Sakonnet River Bridge", will be received by the Division of Purchases at the office of the State Purchasing Agent, Room 123, State House, Smith St., Providence, R. I., until 11:30 A.M., E.D.T. on the 16th day of June, 1954, at which time they will be opened and read in public.

R.I. Contract No. 5453, County of Newport, Towns of Portsmouth and Tiverton, Sakonnet River Bridge No. 250 over the Sakonnet River. This project consists of furnishing, fabricating, erecting and painting all structural steel and associated metals required for the bridge superstructure, including the steel grid floor and structural steel bents, involving approximately 7,880 tons. No concrete is involved in this contract.

Bids for the above work must be made on blanks furnished by the Department of Public Works, Division of Roads and Bridges. Plans and specifications and Special Provisions may be examined at Room 123, State House or 232 State Office Building, Providence, R. I., on and after Wednesday, May 19, 1954, every week day except Saturdays and holidays between the hours of 8:30 A.M. and 4:30 P.M. E.D.T. Blanks for submitting proposals may be obtained thru the office of the State Purchasing Agent at the address above stated. A deposit of $100.00 shall be made for each set of documents, which will be refunded if plans and specifications are returned in good condition within two weeks after the opening of bids.

A certified check or bid bond payable to the State of Rhode Island, or cash, in the amount of $100,000.00 must be furnished by each bidder, which proposal guaranty will be returned after the contract has been executed, unless forfeited in accordance with the stipulations in the proposal.

A performance bond of one hundred (100) percent of the contract price with a satisfactory surety company will be required of the successful bidder. The Division of Purchases reserves the right to reject any or all bids.

EMPLOYMENT LIST: A local employment service has been designated by the R. I. Employment Service to prepare the employment lists for this project. Requests for men to be employed on this project shall be submitted to the District Office, 284 Thames St., Newport, R. I.

WAGES OF LABOR: In conformity with the provisions of Chapters 290 and 291, General Laws, 1938, the minimum wages for a day's work paid craftsmen, teamsters and laborers shall not be less than the customary and prevailing rate of wages for a day's work in the same trade or occupation in the locality where the work is undertaken. Such a schedule of wages has been established on a minimum hourly basis and is on file in the office of the State Department of Labor. The contractor shall pay not less than these minimum rates.

SUBLETTING OR ASSIGNING THE CONTRACT: The attention of bidders is directed to the Standard and/or Special Provisions covering subletting or assigning the contract.

DEPARTMENT OF ADMINISTRATION,
DIVISION OF PURCHASES
By: Franklin A. Adams,
State Purchasing Agent.

Bids: June 15, 1954

Electric Lighting Equipment Contract 358

SEALED BIDS will be received by the Board of Water Supply, at its offices, thirteenth floor, 126 Wall Street, New York City, until 10:00 A.M., Eastern Standard Time, on Tuesday, June 15, 1954, for Contract 358, for furnishing, delivering, installing and testing electric lighting equipment, complete in every respect, for the Rondout and West Branch effluent chambers, West Branch influent chamber, Kensico East influent chamber and coagulating plant, drainage chambers at Shafts 6, 13 and 23, and the water sampling station at Shafts 19 of the Delaware aqueduct, all as set forth in the specifications.

No bid will be received and deposited unless accompanied by a certified check upon a National or State bank, drawn and made payable to the order of the Comptroller of The City of New York, in the amount of ten thousand dollars ($10,000.00) for the proper execution of the contract.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, forms of bid and contract, specifications, contract drawings, requirements as to surety, etc., can be obtained in Room 1316 at the above address, upon application in person or by mail, by depositing the sum of five dollars ($5.00) in cash or its equivalent for each pamphlet. Within 30 days following the award of contract or rejection of bids, the full amount of such deposit will be refunded for each pamphlet submitted as a bid and a refund of four dollars ($4.00) will be made for each other pamphlet returned in acceptable condition. Arrangements will be made whereby prospective bidders desiring blueprints of the contract drawings for their own use may secure same, the cost thereof to be paid by them. For further particulars, apply at the office of the Chief Engineer at the above address.

IRVING V. A. HUIE, President, EDWARD C. MAGUIRE, HERBERT M. ROSENBERG, Commissioners, Board of Water Supply; BETTY COHEN, Acting Secretary.

Bids: June 29, 1954

Contract NYA-530.001

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
BUILDING NO. 142

Sealed proposals for the construction of Building No. 142 at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on Tuesday, June 29, 1954, at which time and place said proposals will be opened and read.

Contract documents may be seen at the office of the Contract Engineer of the Authority, Room 1112. Documents will be furnished upon deposit of $30.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $30.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 719, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to the Contract Engineer, who will furnish the documents.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, June 3, 1954

Read the Official Proposal Columns of ENGINEERING NEWS-RECORD This Week and Every Week

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

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PROPOSALS, $1.80 a line an insertion.

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DISCOUNT OF 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).
EQUIPMENT WANTED or FOR SALE Advertisements acceptable only in Displayed Style.

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The advertising rate is $20.50 per inch for all advertising appearing on other than a contract basis. Contract rates quoted on request.
AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page. E.N.R.

Send NEW ADVERTISEMENTS: To New York Office W. 42nd St., N. Y. 36 for June 17th issue closing June 7th.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

PROJECT SUPERINTENDENT on heavy and highway construction for well established company operating primarily in Ohio, Indiana and Pennsylvania. State age, experience, salary expected, references and availability. P-2709, Engineering News-Record.

CHIEF ESTIMATOR — Substantial heavy construction firm operating on a world wide basis desires experienced construction executive to assume direction of established estimating department in New York City. Substantial experience in site investigation, pre-estimate job planning and final bidding of marine structures, dams, tunnels, power plants, roads, airfields, bridges, etc. essential. Knowledge of foreign construction operation desirable. Willingness to travel necessary. Outline experience in detail. Reply P-2811, Engineering News-Record.

YOUNG ARCHITECT or Engineer design and architectural supervision of construction of store buildings. Degree and 5 years experience. Location Southeast U. S. Considerable traveling. Good future. P-2810, Engineering News-Record.

EXPERIENCED ESTIMATOR and Chief Engineer between the ages of 32 and 42, to make quantity take-offs, help price, buy, expedite and do some field supervision. All our work is competitive. We specialize in industrial, commercial and public works. Only experienced and high-grade men need apply. Permanent job for the right man. Excellent salary and bonus. Office located in Ohio. Send qualifications, experience and photograph, if available. P-2847, Engineering News-Record.

To EMPLOYERS Who Advertise for MEN:

Frequently, when there are many applicants for a position, only the most promising letters are acknowledged. The other applicants never know whether their letters reached a prospective employer or not. These men often become discouraged, will not respond to future advertisements and even question their bona fide character.

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SALARIED POSITIONS $5,000 — $35,000

We offer the original personal employment service (established 44 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars.

R. W. BIXBY, Inc.
659 Brisbane Bldg. Buffalo 3, N. Y.

POSITIONS VACANT

PLANT SUPERINTENDENT wanted for old established structural precast concrete Plant. Preferably with Engineering background. Please submit complete resume stating experience, salary required and date available to P-2395, Engineering News-Record.

TEACHING POSITION — Engineering graduate, industrial and teaching experience desirable. Opportunity to work on advance degree. Salary depends upon qualifications. Write Head, Department of Engineering Drawing, Iowa State College, Ames, Iowa.

ENGINEERS DESIGNERS. Engineering Draftsmen for established consulting firm designing sewers, pumping stations, sewage treatment plants, water supply system, etc. Layout and detail drafting on structures, piping, reinforced concrete. Structural and hydraulic computations, specifications. Give full particulars. Location, New York State. Our employees know of this advertisement. P-2649, Engineering News-Record.

BRIDGE—HIGHWAY Engineers—Designers—Draftsmen. For work on bridges, expressways and turnpikes. Location Midwest. Permanent positions with periodic promotions depending on experience and ability. Paid vacations, sick leave, hospitalization and life insurance. Include education, experience, reference and salary expected in application letter. P-2109, Engineering News-Record.

PROJECT MANAGER: Large expressway project in Maryland. Engineer with extensive bridge and highway experience to manage office, design and production of plans for bridges, interchanges and highways. Furnish qualifications, salary expected and availability. P-2864, Engineering News-Record.

CIVIL ENGINEER: Experienced in Supervision of Triangulation Surveys. Location mid-west. State education, experience, salary desired and references. P-2681, Engineering News-Record.

EXPERIENCED STRUCTURAL Engineer for Design and Estimating Industrial type Buildings. Write Allied Steel Products Corporation, P.O. Box 6168, Tulsa, Oklahoma.

EXPERIENCED STRUCTURAL Steel Detailers and Checkers. Write Allied Steel Products Corporation. P.O. Box 6168, Tulsa, Oklahoma.

FOREMEN FOR Bridge Construction. Pile-driving, concrete, cofferdams, structural steel. Well established Southern firm adding to permanent organization. State age, salary expected, education, availability, give detailed resume experience and list references. P-2879, Engineering News-Record.

CHIEF ENGINEER for general contractor operating Southern states all-types heavy construction including highways, tunnels, bridges, foundations, piledriving, railroad, marine work, earthfill dams, bituminous and concrete paving, utilities, etc. Assume responsibility estimating, purchasing, cost control, subcontracts, general field supervision. State age, education, salary expected, experience, references, availability, all in detail first letter to Box P-2880, Engineering News-Record.

(Continued on the following page)

ENGINEERS
Foreign Service

Graduate Chemical, Mechanical, Electrical & Construction Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of construction, estimating materials and cost control, planning and refinery process work. Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 30

Arabian American Oil Company
505 Park Avenue, New York 22, N. Y.

BRIDGE ENGINEERS AND SPECIFICATION WRITERS

Civil Graduates of accredited U. S. colleges. Must have not less than the following experience:

Detailers—2 years structural steel or reinforced concrete detailing.

Designers—5 years responsible work on structural steel and concrete including work on long span bridges.

Squad Leaders—3 years responsible charge of squad on structural steel detailing.

Specification Writers—With design and field experience for writing specifications for steel bridges, concrete structures, and highway construction.

Please mail complete resume together with salary required to:

Howard, Needles, Tammen & Bergendoff
55 Liberty Street New York 5, N. Y.

STRUCTURAL DETAILERS CHECKERS

Must be experienced, ideal working conditions. Air-Conditioned Office. Employees' Benefits. Vacation with Pay — Salary Commensurate With Ability.

Housing Available—

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BOX 341 ORANGE, TEX.

QUANTITY SURVEY TAKE-OFF MAN

Must be experienced in excavation, concrete, masonry, and carpentry take-off, for all types of public, commercial and industrial buildings. Reply giving age, education, experience, salary desired. Milwaukee, Wisconsin.

P-2860, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

POSITIONS VACANT
(Continued from preceding page)

WRECKING FOREMEN—To take charge of building wrecking projects throughout the country. These are not desk jobs, but positions that require aggressive, hard-working supervisors who can roll up their sleeves and supervise wrecking crews right on the job. You will be working with the nation's foremost demolition contractor. To those men who can meet these qualifications, we offer a good paying position with a good future. Prefer men with previous wrecking experience, but will consider ironworker or construction foremen. Give experience, age, references, salary desired, and enclose snapshot, if possible. Reply Box No. P-2904, Engineering News-Record.

WANTED: Instructor of Engineering Drawing and descriptive geometry. Salary up to $47.00 for 9 month period and assistant professorship for qualified person. M. E. graduate preferred. Dept. of Engr. Drawing, University of North Dakota, Grand Forks, North Dakota.

WANTED, ENGINEERS, competent and experienced in design and supervision of construction as resident engineers on water works, sewer systems, sewage and water treatment. State experience, when available, salary requirements, references. Box P-2893, Engineering News-Record.

THE TOWN of Trumbull, Connecticut, population 12,000, needs Town Engineer to assume complete responsibility of establishing own department. Excellent opportunity. Salary $5200 per year. Please give summary of education, experience and availability. Write, Selectmen, Town of Trumbull, Connecticut.

MALE HELP Wanted: Experienced Structural Draftsman. Personnel—Box 1087, Charlotte, 1, N. C.

WANTED BY long established Consulting Engineer the following men for permanent positions: Bridge Designer with at least 5 years experience in both steel and reinforced concrete. Structural Engineer, recent graduate with good theoretical knowledge. Highway Engineer, experienced in interchange design. P-2913, Engineering News-Record.

GENERAL SUPERINTENDENT for company doing heavy, municipal, utility, etc. in vicinity of city of 150,000. Must be able to handle overall management of work. Good opportunity, permanent for right man. Give salary expected, age, family status, through resume of experience. Reply Box 3041, Evansville, Indiana.

SELLING OPPORTUNITY OFFERED

SALES ENGINEER — Rochester, New York and Pittsburgh, Pennsylvania territories open with established national concern selling prefabricated metal products to engineering and construction markets. Positions are permanent and offer excellent future with aggressive, progressive and expending organization. Engineering degree desirable. Previous sales experience unnecessary. Ages 24 to 30. Car furnished. Complete training program. Salary and bonus. RW-2289, Engineering News-Record.

EMPLOYMENT SERVICE

OVERSEAS PROJECTS Guide to most active constructors-engineers, oil co's., gov't & UN groups hiring for foreign projects. Send $1. Cove-McKane Int., GPO Box 126E, NY 1, NY.

POSITIONS WANTED

MECHANICAL SUPT., Mechanical inspector or master mechanic. Twenty-five years' experience with Erection, Repair, Maintenance of heavy industrial equipment in Power Plants, Pumping Stations, Industrial Buildings, Supervising Installation, Testing Air Conditioning, Freon Refrigeration, Steam Boilers, Steam Distribution, P.O.L. Systems, Heating, Plumbing, Diesel Engine Driven Generators. Available now. PW-2753, Engineering News-Record.

CHIEF ESTIMATOR or Operation Executive: Available for General Contractor with sufficient volume to warrant experienced personnel. Currently employed but wanting other connection, preferably in the South. PW-2686, Engineering News-Record.

GENERAL SUPERINTENDENT and Engineer desires work in California or West Coast after July 15th. Experienced heavy construction: roads, bridges, foundations, Cobi pile, vertical sand drains, marine work, estimating. PW-2688, Engineering News-Record.

SUPERINTENDENT OF Building Construction, desires position, preferable East. Diversified experience, majority, schools, banks, theaters, clubs, Commercials and Government work. Full responsibility. PW-2793, Engineering News-Record.

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3 years atomic energy project, total 8 years personnel administration experience. Well versed all phases industrial relations, field acctg., costs and purchasing. Available now. Domestic or foreign. Age 37. Contact:

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ENGINEER, REG. P.E. 40 years' experience. Adjustment of contractors' claims. Change orders. PW-2840, Engineering News-Record.

ARCHITECT/OWNER Representative — or comparable executive position where 25 years of diversified construction experience will be utilized. Age 46, 18 years as contractors' Superintendent and Engineer. Past 7 years as Architects' Representative on multi-million dollar projects. Now completing supervision of largest General Office Building built in suburban New York area. Only New York Area considered. Raymond V. Hand, Baldwin Road, Yorktown Heights, New York.

CONSTRUCTION AND Field Engineer. Registered. Age 54. Broad experience preliminaries, design, layout and construction. Waterworks, sanitation, industrial, railroad, development, heavy construction. Available 3 weeks. No straight drafting or design. Prefer supervision construction program for owners. PW-2827, Engineering News-Record.

CARPENTER FOREMAN, 25 years experience in all phases of Bridge, or building construction, available at once. PW-2876, Engineering News-Record.

CIVIL ENGINEER, BSCE, married, 32, desires position with general contracting firm in west or midwest. Estimating and field experience, heavy construction. Good accounting background. PW-2856, Engineering News-Record.

CONSTRUCTION SAFETY direction or engineering; 35, college trained, single, in fourth year of safety work having just completed two years on largest construction job in world, relocate United States or overseas. PW-2858, Engineering News-Record.

REGISTERED CIVIL Engineer 25 years experience highways, bridges, power plants, buildings. Design, construction. Available now. PW-2875, Engineering News-Record.

PLANT LAYOUT & Construction Engineer, 50, experienced Designer Piping, Processing & Material Handling equip't., Mechanical Installations and structures. Will relocate. PW-2907, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT, 20 years experience as superintendent and construction administrator on industrial, commercial and federal construction projects, seeks similar position. Presently employed as general superintendent for large National chain store. Available immediately. PW-2906, Engineering News-Record.

PROJECT SUPERINTENDENT capable of estimating handling sub contractors and running entire project. Age 37. 18 years' experience will travel minimum salary $800.00 per month. PW-2894, Engineering News-Record.

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Complete Building Estimators Course, also Building Labor Calculator for practicing estimators. Thirty-fourth year serving the building industry. For free trial and all particulars write:

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POSITIONS WANTED

CHIEF ACCOUNTANT available about June 30, 20 years diversified experience. Sober, reliable and capable of taking complete charge of either field or home office, any size project. Would be of especial value where cost segregation and capitalization of construction costs are a problem. PW-2868, Engineering News-Record.

ASST. SUPT. or General Foremen 25 yrs. experience Subway, tunnels, sewers, utilities Road & Bridge constr. Foundations & Underpinning. Information furnished on request. PW-2889, Engineering News-Record.

ESTIMATOR—ten years of power and Industrial construction—five years field experience, west coast preferable. PW-2912, Engineering News-Record.

ASSISTANT SUPERINTENDENT & Field Engr. B.S.C.E. registered 5 yrs. const. exper. Resume on request. PW-2910, Engineering News-Record.

ADMINISTRATIVE — Field Office Manager qualified to handle all phases of office methods and procedures. Thorough knowledge of purchasing, escalation & premium time invoicing, labor cost distribution and payroll. Graduate of Accounting College. Eight years field construction experience. Desirous of connection with construction company in administrative or supervisory capacity either foreign or U. S. PW-2909, Engineering News-Record.

SALES ENGINEER—Graduate civil engineer, registered, age 39. Proven record sales, research, development. Broad experience in concrete, admixtures, lightweight aggregates, concrete products. Seeks responsible position in ready mix, concrete products, or consulting firm Penna. Ohio, N. Y. Box PW-2792, Engineering News-Record.

SELLING OPPORTUNITY WANTED

SALES ENGINEER now contacting General and Building Contractors in Southeast desires lines. SA-2874, Engineering News-Record.

GLAZER STEEL Corp.

Structural and Plate Steel Fabricators

Open capacity for quick delivery now available. We solicit your inquiries for Steel Fabrication and Warehouse Steel Products. Let us figure your jobs . . . Large or Small.

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20 Ton Tourneaucrane, Army type preferred.
D8 Angle Dozer, above 2U5300 Serial.
Northwest Truck Crane, must be in excellent condition
Sheepsfoot Roller, 5' Diameter drum.
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1—Swing Clutch Assembly for a Model 6 Northwest.

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FORMS FOR CONCRETE PAVING
3000 ft., 15"x19" steel dual purpose forms for airport paving or 3000 ft., 15"x15" steel forms for airport paving.
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Bought new, and used 2 months on one job.

2—3" **Atomic Prime High Capacity Combination Centrifugal Electric pumps**, one with Allis Chalmers 5 h.p., one with Electro Dynamic motor 5 h.p., each with vacuum. Pump manufactured by Gast Mfg. Co. 220-440 V. A. C.

Cost: $792.00 each. Sale Price: $520.00 each.

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Cost: $742.00 Sale Price: $495.00

2—1½" **Carter Model TL Basic SPC self priming centrifugal pumps** one with Westinghouse 3 h.p. 220-440 V. A. C., other with Charlerol 3 h.p. 220-440 V. A. C. induction motor.

Cost: $127.00 each. Sale Price: $100.00 each

All of the above now in Brooklyn, New York. Equipment being sold as is, where is.

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SHOP: 105 Freeman Street, Brooklyn, New York, EV. 9-6518

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FOR SALE

1201 Lima Crane combination shovel, Dragline and Clamshell, 3½ cy Esco Bucket

2—Euclid Mod 27FD End Dumps, 12 cy cap 165 HP Cummins, late transmissions
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1—500 CFM Chicago V type 100 HP Compressor
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Northwest 80D Shovel-Dragline, New 1948.
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Lorain 80—1½ yd. Diesel Shovel Crane.
P&H 955-ALC. Diesel Crane, 130' boom, 1951.
Lima Model 1201 Diesel Shovel 3½ yds.
Buc. Erie 54-B Shovel-Dragline, Excellent.
Buc. Erie 120-B Electric Shovel, 5 yds.
Lorain L820 Shovel-Crane-Drag, 2 yds.
Manitowoc Mod 3500 Diesel Shovel.
Manitowoc 4500 Shovel-Dragline, New 1951.
Lorain Mod. Mc-414 Moto-Crane 70 ft. Boom.

WHIRLEY-GANTRY-PORTAL CRANES

American Mod. 10125, 50 tons, 40' radius 125' boom.
Colby Mod. 200, 45 tons, 30' bm., 10' whip.

DITCHERS

Buckeye Model 160, Excellent.
Parsons Model 310.
Cleveland Model 320, Diesel powered.

CONCRETE PLANTS—BINS & SILOS

B-K 100 ton, 3 comp., 2 Cement Silos 450 bbls. ea.
Noble CA-155 Fully auto., 5 comp. New 1951.
Noble CA-154 auto., 4 comp., 2 yd. Smith Tilt Mixer.
Johnson 150 yd. TY-276 bin, 4 comp., 3 agg., 1 Cement, Comp.
Heltzel 4 Comp., 3 agg., 150 yds., 200 bbls. cement.
Johnson 200 yds., 4 agg. bins, 200 bbls. Cement Ceu.
Cement bin 400 bbls. with batcher, NEW.
Agg. bin, 100 tons 3 cpts. 2 yd weighbatcher, NEW.
2 Smith 56-S tilting 2 yd. elec.
Seaman Bituminous Mixer Model MHD 72-33.

ASPHALT PLANTS

Barber-Greene 848 complete plant.
Madsen 4000# complete, Excellent.
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Barber-Greene 845, Complete.
Simplicity Model S-100, Diesel powered.
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Amer. 30 ton Guy derrick 116' mast 106' boom.
Amer. 15 tons steel stiff leg 75' boom.
Steel stiff leg 25 tons 75 ft. boom.
Steel Stiff leg Derrick 50 Ton, 100' Boom.
Steel stiff leg derrick, 30 tons, 100 ft. boom.
Guy-Erectors 110' Mast 100' BM., 35 Tons.

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4 good used Super C Tournapulls, in good operating condition . . . . $4,000.00 each.

3 good used Wooldridge Terracobras, in good operating condition, with tires in good condition, $4,500.00 each, f.o.b. Peoria.

We invite your inspection of these machines.

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Lima 750
P and H 655 BLC
P and H 955-A
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P and H 255A
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Lorain MC414

All modern and top condition. Used on hook work only. All with long boom and jib.

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P&H SHOVEL

One 3 yard, Model 1055—P & H Shovel—Serial 12394. Excellent condition. Telephone —New Haven, Conn. State 7-5746

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UNIT CAPACITIES—10 TO 2475 KVA
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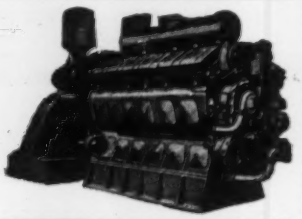

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KW	Make	Model	HP	RPM	KW	Make	Model	HP	RPM
1180	Worthington	8EH-8	1685	360	400	Ingersoll-Rand	8-8	600	720
1136	Fairbanks Morse	38D	1600	720	350	Baldwin	VO-6	510	450
1106	General Motors	16-278A	1600	720	320	Enterprise	DSG-6	560	450
750	General Motors	12-567	1080	720	300	General Motors	8-268A	450	1200
706	Worthington	EE-8	1000	327	200	General Motors	8-268A	350	900
500	General Motors	8-278A	750	720	150	Worthington	CC-4	225	450
500	General Motors	8-567	720	720	150	Ingersoll-Rand	8-4	225	600
500	Alco	6-12 1x13T	750	600	150	Buckeye	80	240	600
486	Worthington	DD-8	700	360	100	General Motors	3-268A	150	1200
400	Sterling	VD8-8	600	1200	60	General Motors	6-71	90	1200

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142 CFM Ingersoll Semi-Portable 25 HP
160 CFM IR-Worth Portable
165 CFM Smith 110SR Semi-Portable, 25 HP
167 CFM 10 x 5 Ingersoll Vacuum Pump—7½ HP
195 CFM 8-9 x 9 Worthington HS STEAM
210 CFM Worthington (GAS or DIESEL) Port
211 CFM 9 x 9 Chicago T-B 30 HP Elec
279 CFM 11-10 x 11 Worthington HS Steam
294 CFM 10 x 11 Worthington HB 50 HP Elec.
315 CFM Worthington (GAS or DIESEL) Port
434 CFM 14 x 7 Ingersoll Vacuum Pump—15 HP
492 CFM 13½/9 x 10 Chicago 0-CB Duplex 75 HP Elec
600 CFM Worthington (DIESEL) Portable
628 CFM 14 x 13 Ingersoll ES-I, 100 HP
720 CFM 18 x 7 Worthington HBV Vac Pump 25 HP
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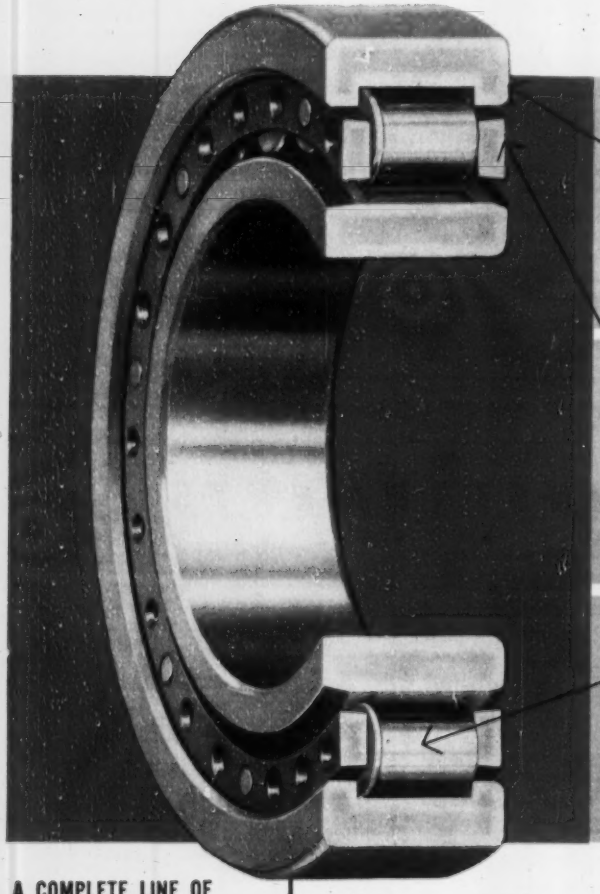

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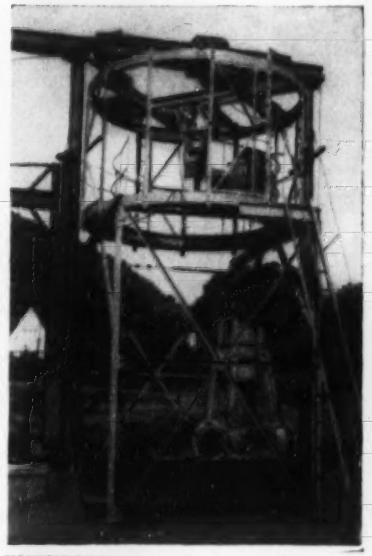


EXTERIOR view shows cage-like construction of revolving upper platform.

GRAPPLE ACTION is controlled from shaft bottom; positioned from cage.

Pneumatic grapple doubles speed of clamshell in mucking operations

A development, used first in mine shaft digging in Germany, has been introduced as a method of sinking the shafts required for some tunneling jobs. Advantages claimed for the new device are fast operation with a two-man crew and operation from usually available air supply.

The equipment consists of two parts; the pneumatically operated grapple and a caged revolving platform for positioning the grapple and spoil buckets. The 0.4-cu yd grapple is of a new design featuring six independently-mounted chrome vanadium steel tines. The floating action of the slideways that actuate the tines is said to allow the tines to act like separate fingers—staying back or advancing according to the resistance met. This action eliminates breaks or bending from stress.

Since the operation of the grapple is pneumatic, only one cable is required between it and the positioning stage. Grapple action is controlled by the operator at the bottom of the shaft. Remote control can also be set up so that this man can also control the actions of the revolving stage.

However, in general practice a second man is stationed on the upper stage. This frame-like construction also carries the compressed air equipment and a hoist for lowering and lifting the grapple and the spoil buckets. The stage is built to revolve so that all portions of the shaft cross section can be reached conveniently.

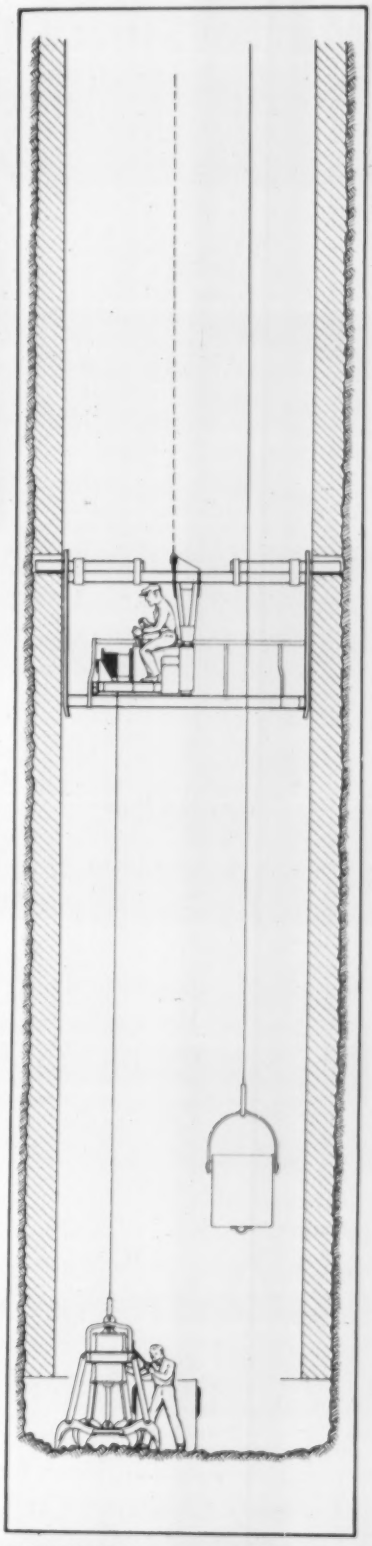
The platform is fastened by removable bars slid into niches in the shaft walls—a cushioning material is used between the supporting bars and niches. During blasting, at least 20 ft is maintained between the bottom of the cage and the blasted area. After 70 ft of depth has been reached it is necessary to relocate the platform. This is done by retracting the bars and lowering the stage by means of tackle blocks and the platform hoist.

Quick-setting cement together with reinforcing bars are used to secure the wall after each blasting. In hard rock this securing can be done after 45 or 60 ft has been removed.

The manufacturer's records indicate that this system employing a 0.4-cu yd grapple will remove 21 to 26 cu yds per hr—about twice as fast as a ½-yd clamshell and ten times as fast as hand methods.

Grapple sizes range from 0.3 to 1.3 cu yds and are priced accordingly from $4,950 to $9,000. Weights range from 2,300 to 5,700 lb. Sizes 0.3 and 0.4 cu yd have six wide-bladed tines, all others have eight tines. The revolving cage sells for about $20,000. RUHR INDUSTRIES, 1411 WALNUT ST., PHILADELPHIA 2, PENNA.

(*New Products continued on page 110*)



CUTAWAY shows system in operation.

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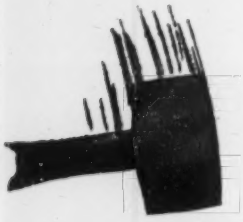

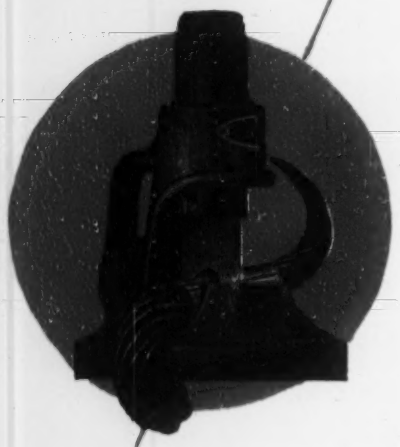

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NEW PRODUCTS

Electronic pipe finder boasts rugged construction

The Electronic Witch is a new electronic instrument said to feature greatly improved operational and overall field performance for locating and tracing buried pipes, conduits and metal objects.

A new circuit has been developed that is reported exceedingly stable for all field applications and insensitive to temperature changes and the shock and vibration of everyday field use. In addition it is claimed that the "B" battery consumption is reduced by more than 50 per cent—"A" battery life is similarly increased.

The receiver selectivity and the instrument's operational frequency combine to make the new locator less sensitive to all types of outside interference and particularly that associated with neon signs and overhead power lines.

A sensitive fluid leak detector has been incorporated in the Electronic Witch so that it can be used as an emergency leak detector.

Instrument cabinets are moulded of glass fiber-reinforced plastic and are said to be practically indestructible. When not in use the two halves of the detector fit together to form a small, conveniently carried case. FISHER RESEARCH LABORATORY, INC., PALO ALTO, CALIF.

Easy handling and economy claimed for tile adhesive

A newly-developed ceramic tile adhesive called CTA-11 has a soft, "buttery" consistency that the manufacturer claims is ideal for fast, easy handling.

In addition to ease of handling, the tan colored synthetic rubber product

(Continued on page 113)

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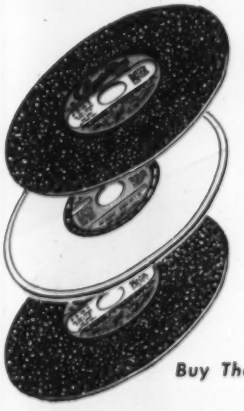

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is reported to set 60 to 70 sq ft per gal, i.e., 1 lb of CTA-11 will do the work of about 40 lb of wet mortar.

The new compound is said to eliminate much of the time consuming surface preparation and permits reoccupation of a room within 36 hrs—compared with several days when mortar setting is used. In addition, CTA-11 has a relatively long open bonding time, ranging from a minimum of 5 min. to 45 min.

Dry adhesive bonds with CTA-11 are reported to have a shear strength of more than 640 lb per tile, and that under this load the bond does not fracture but stretches out; adhesion is retained. Good aging qualities are also claimed. Adhesives and Coatings Div., Minnesota Mining & Mfg. Co., Minneapolis, Minn.

1.7-kw generator fits into car trunk, is low in cost

A new lightweight portable generator is rated at 1.7 kw and sells for $324.50. Weighing only 109 lb, the Gen-A-Matic, as it is called, is reported to fit compactly into a car trunk or small pick-up.

The generator has a special ignition system said to permit easy starting, and other construction features, such as moisture proofing, are said to insure dependable all-weather operation.

Other advantages claimed for the 115-v DC unit are: heavy-duty brush mounting to give low current density and long life; hard-drawn copper commutator of V-ring construction and mica insulation undercut to increase brush life; and direct mounting on engine shaft of the armature to insure alignment of generator and engine. Multi-Matic Corp., 14741 Bessemer St., Van Nuys, Calif.

Low-cost power hoist has 500-lb lifting capacity

A 500-lb capacity power hoist has been developed for lifting loaded wheelbarrows, pallets of roofing materials, brick, etc., and is designed to sell for $219.

The hoist uses a V-belt drive between the geared gasoline engine and the drum, and an adjustable idler pulley is used to tighten the belt and provide clutch action.

The braking mechanism uses nylon rope around the brake drum and is said to provide proper friction for holding or lowering loads at any speed in response to finger-tip control.

A 2½-hp, 4-cycle engine reels the 200-ft steel cable at an approximate

(Continued on page 114)

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Revolving and swing door combination is "packaged"

International Steel has developed a new line of "packaged entrances" that can include any number and combination of revolving and swing doors, individually adapted in overall architectural design for a specific building. The cost of the package is said to be considerably less than the same number of doors ordered individually by the purchaser.

Not a mass production item, the International-Van Kannel entrances are designed and fabricated after conference with the building owner, contractor or architect. The "package" includes the doors, jambs, side lights, transoms, pushbars, extruded aluminum thresholds, locks, speed controls, finishing details and ornamentation.

Other, smaller packages include either revolving or swing door assemblies. INTERNATIONAL STEEL CO., 1321 EDGAR ST., EVANSVILLE, IND.

Medium weight unit fills out Page bucket line

Available in ¾ to 3-cu yd capacity, RM Class dragline buckets have been designed and built to excavate sand and loose gravel as well as dirt, clay or any material free of stumps and boulders. The medium weight buckets have a new knife-edged lip and replaceable teeth cast of high manganese steel to withstand shock and abrasion. Page Engineering Co., Dept RM, Clearing Post Office, Chicago 38, Ill.

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Splicing and repair of belts—A 32-page, illustrated manual that tells how to splice and repair conveyor and elevator belting has just been published by THE B. F. GOODRICH CO., AKRON, OHIO.

Windows—Aluminum projected windows and projected ribbon windows are the subject of a new 20-page catalog. The publication includes illustrations describing the full size sections, layouts, and brief specifications. A section of the book is devoted to new ideas on panel wall window arrangements showing windows in band, tier and flush-wall arrangement. THE WILLIAM BAYLEY CO., 1200 WATER ST., SPRINGFIELD 99, OHIO.

One-man elevators—A new 8-page bulletin illustrates the line of Humphrey Manlift Elevators to be used in multi-floor buildings where there is vertical processing of products and/or where frequent, quick inspection of machinery on various levels is required. These elevators provide simultaneous up and down employe transportation with no waiting or delay. Bulletin HB-54. HUMPHREY ELEVATOR CO., INC., FARIBAULT, MINN.

Grating—Catalog No. F400 contains illustrations, descriptions and complete engineering data on flooring gratings, treads and floor armoring (riveted, press-locked, welded types). IRVING SUBWAY GRATING CO., INC., 50-09 27TH ST., LONG ISLAND CITY 1, N. Y.

Wire rope—A 24-page booklet gives basic information on wire rope construction and the "why's" and "where's" of their use. E. H. EDWARDS CO., 200 BUSH ST., SAN FRANCISCO 4, CALIF.

High temperature piping — "Hydrotherm Bulletin No. 100" discusses and illustrates the applications of high temperature, high pressure water in

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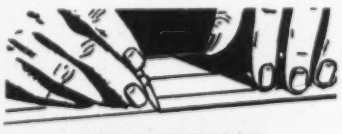

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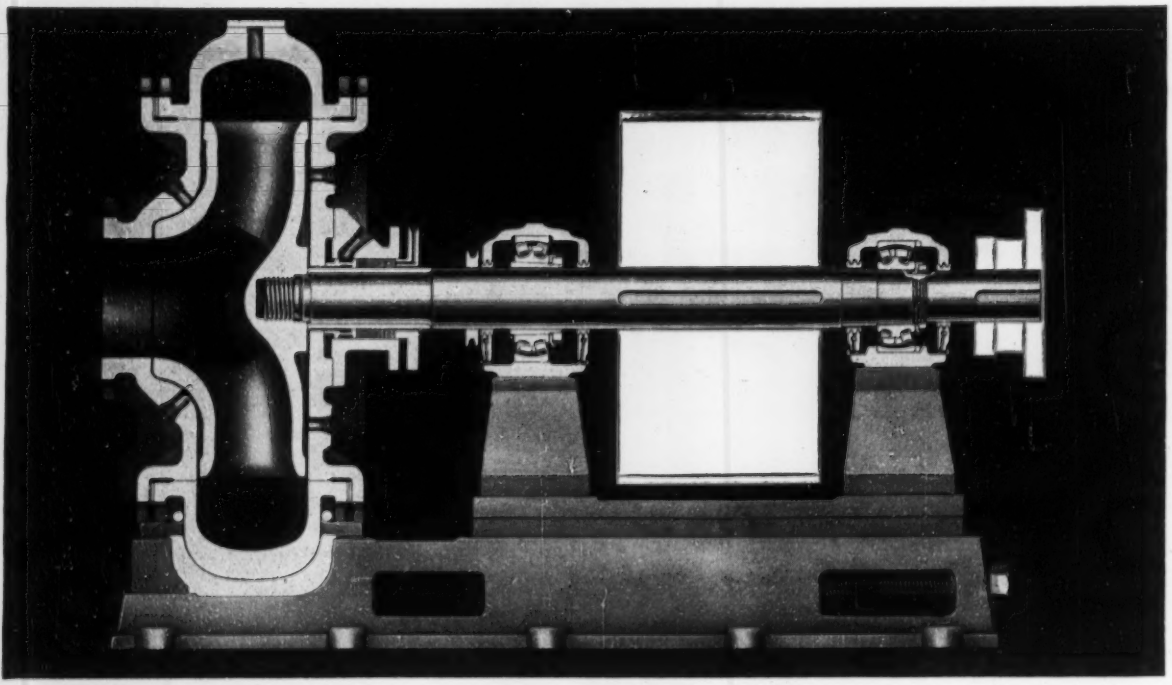

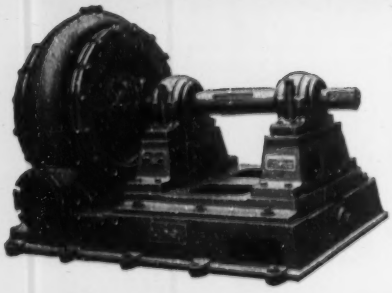

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	10%		15%		20%	
	Yds/hr	Tons/hr*	Yds/hr	Tons/hr*	Yds/hr	Tons/hr*
800	24	32	36	48	48	64
1000	30	40	45	60	60	80
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Corrugated steel sheet—Cofar Product Manual is a 28-page booklet devoted to description, use, advantages, projects, installation, details, selection tables, and specifications of the company's line of corrugated steel sheeting. GRANCO STEEL PRODUCTS CO., GRANITE CITY, ILL.

Wood structures—"Structural Wood Products" is the title of a 24-page booklet describing the use of wood in construction of roof trusses, truss rafters, segmental arched rafters, and girders. Other sections are devoted to descriptions of treated-timber retaining walls, and suggestions for architectural drawings. WEYERHAEUSER SALES CO., TACOMA, WASH.

Splicing and fitting wire rope—A 32-page booklet gives step-by-step directions for the splicing and fitting of wire rope. Fully illustrated, the publication describes the methods used in making marine eye splices, blocking and serving, loggers eye splice, rolled in eye splice, endless splice and the making of grommets. E. H. EDWARDS CO., 200 BUSH ST., SAN FRANCISCO 4, CALIF.

V-belt drives—A 6-page interim bulletin provides in condensed form the necessary information on the new method of calculating horsepower capacity of a "Texrope" V-belt drive. The belt ratings resulting from this new method take into consideration the effect of belt length, ratio of the diameters of both the driving and driven sheaves upon the horsepower rating of the belt and resultant belt life. Bulletin 20B6956B, "GUIDE FOR FIGURING TEXROPE DRIVES". ALLIS-CHALMERS MFG. CO., 1018 S. 70TH ST., MILWAUKEE, WIS.

ADVERTISERS IN THIS ISSUE

Acker Drill Co. ... 78
Aetna Casualty & Surety Co., The ... 83
Allis-Chalmers Mfg. Co. (Tractors) ... 6
Allison Engine Div., G. M. Corp. ... 52, 53
American Bitumuls & Asphalt Co. ... 65
American Foreign Insurance Assn. ... 62
American Hoist & Derrick Co. ... 79
American Manganese Steel Div., American Brake Shoe Co. ... 118
American Mutual Liability Ins. Co. ... 60, 61
American Steel Dredge Co., Inc. ... 74
American Vitrified Products Co. ... 5
Armco Drainage & Metal Products Inc. ... 18
Atlas Powder Co. ... 81

Baker-Roos, Inc. ... 63
Barber-Greene Co. ... 78
Bay City Shovels, Inc. ... 85
Belmont Iron Works ... 78
Berger & Sons, Inc., C. L. ... 36, 37
Besser Mfg. Co. ... 49
Bethlehem Steel Co. ... 75
Blaw-Knox Co. (Gratings) ... 14
Bower Roller Bearing Co. ... 108
Bruning Co., Inc., Charles ... 69
Buffalo-Springfield Roller Co. ... 73
Butler Bin Co. ... 38
Byers Co., A. M. ... 2nd Cover

Cast Iron Pipe Research Assoc., Inc. ... 12, 13
Cement Gun Co. ... 8
Cities Service Oil Co. ... 11
Clipper Mfg. Co. ... 111
Clyde Iron Works, Inc. ... 50
Concrete Reinforcing Steel Institute ... 33
Concrete Surfacing Machinery Co. ... 72
Construction Machinery Co. ... 84
Cotta Transmission Co. ... 87

Dorr Co. ... 67
Douglas Fir Plywood Assn. ... 91
Dudgeon, Inc., Richard ... 87

Economy Forms Corp. ... 72

Flexible Road Joint Machine Co. ... 76, 77
Ford Motor Co. ... 16
Foundation Equipment Corp. ... 2

Goodyear Tire & Rubber Co. ... 1
Granco Steel Products Co. ... 42
Greer & McClelland Co. ... 116
Griffin Wellpoint Corp. ... 86
Gunite Concrete & Const. Co. ... 78

Harnischfeger Corp. ... 58
Higgins Ink Co. ... 116

Imperial Pencil Tracing Cloth ... 114
Inland Steel Products Co. ... 54
Insley Mfg. Corp. ... 59
Irving Subway Grating Co. ... 116

Jaeger Machine Co. ... 20

Larsen Products Corp. ... 114
LeTourneau-Westinghouse Co. ... 57
Louisville Cement Co. ... 15

MacArthur Concrete Pile Co. ... 83
Mahon Co., R. C. ... 10
Master Builders Co. ... 3rd Cover
McDonough Steel Co. ... 72
McKiernan-Terry Corp. ... 66
Morse-Starrett Products Co. ... 110
Mueller Co. ... 115

Northwest Engineering Co. ... 3

Ozalid Products Div., General Aniline & Film Corp. ... 113

Palmer Electric Mfg. Co. ... 8
Pennsylvania Drilling Co. ... 87
Phoenix Bridge Co. ... 110
Portland Cement Assn. ... 45

Raymond Concrete Pile Co. ... 9
Ryerson & Sons, Inc., Jos. T. ... 86

Sanstorm Mfg. Co. ... 87
Sauerman Bros., Inc. ... 83
Servicised Products Corp. ... 58
Sika Chemical Corp. ... 82
Smith, Gordon & Co. ... 68
Smith Engineering Works ... 4
Soiltest, Inc. ... 114
Spencer, White & Prentis, Inc. ... 55
Sprague & Henwood, Inc. ... 74
Stang Corp., John W. ... 66

Tapecoat Co. ... 64
Terry Steel Contractors, Inc. ... 58
Texas Company ... 4th Cover
Timken-Detroit Axle Div., Rockwell Spring & Axle Co. ... 70, 71
Timken Roller Bearing Co. ... 7
Tinney Drilling Co. ... 110
Tirfor Griphoist Co. ... 56
Truck Mixer Mfg. Bureau ... 88

U. S. Pipe & Foundry Co. ... 117
U. S. Steel Corp. ... 46, 47
Universal Sewer Pipe Corp. ... 41

Wheeling Corrugating Co. ... 112
White Motor Co. ... 29
Wood Co., R. D. ... 74

Youngstown Sheet & Tube Co. ... 35

Professional Services ... **107**

SEARCHLIGHT SECTION

(Classified Advertising)

H. E. Hilty, Mgr.

Employment ... 99, 100
Educational ... 100
Notices
Proposal ... 95-98
Equipment
(For Rent, Sales, Wanted) ... 100-107

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EDITORIALS

Space structures on the increase

WHILE TWO TREES don't make a forest, it may be safe to assume that a trend toward greater use of space structures is growing, as a result of architectural preference and imagination. Last year, a three-dimensional catenary roof was built for the Livestock Pavilion in Raleigh, N. C. (ENR Feb. 5, 1953, p. 31), and this year a tripod dome is being constructed for an auditorium at Massachusetts Institute of Technology (ENR May 27, p. 30). In addition, numerous, but not so spectacular hemispherical domes and cylindrical-shell roofs have been added to the skyline. These are demonstrating that not only is it practicable to design and erect such structures, but economically feasible as well.

The fact that space structures require less material than ordinary beam-and-post construction has long been recognized. But for many reasons three-dimensional stress distribution has not been used more extensively up to now. Chief barriers have been complexity of design calculations, inadequate structural theory, lack of suitable materials, difficulty of construction, cost of enclosing and heating waste space where minimum headroom requirements are exceeded, and difficulty of making alterations. Some of these disadvantages may never be overcome, but others are being eliminated.

In recent years, singly and doubly curved structures have been investigated extensively, and the findings have greatly enriched structural theory. In many cases, it has been possible to devise shortcut design procedures, or at least to delimit the range in which such methods are accurate. A good example is the work done on cylindrical shells, published in a manual last year by the American Society of Civil Engineers. The resulting design simplifications encourage greater use of space structures.

Lending further impetus to space structures, lowcost, lightweight materials of adequate strength are now available. The Raleigh pavilion demonstrated the suitability of light-gage metal sheets and high-tensile-strength strands for catenary structures. The MIT dome, and other space structures too numerous to mention, indicate the excellence of reinforced concrete where compressive as well as tensile stresses must be resisted. Both steel and timber have been used successfully for framing structures of the lamella type. And there are many examples where plywood provides a satisfactory shell.

As experience with space structures grows, contractors have been developing more economical construction methods. In the case of cylindrical concrete shells, for example, costs have been cut through the introduction and continuing improvement of rolling forms. Abroad, spectacular use has been made of precast concrete units for framing space structures.

Engineers and contractors have thus shown themselves willing and able to meet the challenge of imaginative design. With architects thus encouraged, there is reason to believe that the use of space structures will continue to increase.

Catching up with progress

NEW YORK'S Westside Elevated Highway is to be modernized, a fact that has national significance, since the example it set when it was started 25 years ago and the successes and shortcomings it developed in subsequent service have influenced highway design for the better.

The elevated structure extends for about five miles along New York's Hudson River waterfront. It has a 3-lane (30-ft) wide roadway in each direction, but can accommodate only two lanes at two points because of sharp curves. These were thought necessary at the time to avoid buying expensive property—an example of false economy that present-day highway engineers avoid.

Another source of delay to traffic is the central location of the exit and entrance ramps. They take off and enter the left-hand lanes, an arrangement adopted to simplify the structural work and cause less interference with traffic at street level below. Also, the 30-ft wide roadway, though adequate by standards of that day, now is known to be too narrow for safe, fast movements when the traffic load is heavy.

Finally, the granite-block pavement, which was laid in the belief that it would outlast any other type of pavement, has been a constant source of complaint, chiefly because of its rough-riding characteristics in comparison with concrete or bituminous surfacing. Despite these weaknesses, the highway carries 93,000 vehicles a day, and provides by far the quickest way to drive down the west side of Manhattan Island.

Over the years, the savings made by use of sharp curves, central ramps and granite block paving have proved to be costly in time lost and accident incidence. Still the designers cannot be criticized for that—they had little to guide them, and there was considerable opposition to the project as being too costly and of doubtful value as a means for reducing traffic congestion on the city's interior streets.

Actually, as a result of their pioneering venture, many useful lessons have been learned and applied to the design of the elevated sections of the urban expressways of today. Lanes are wider and curves are made flat enough for safe operation at the speeds for which the structures are designed. Similarly, entrances and exits generally are provided with acceleration and deceleration lanes and are laid out for safe driving and reasonable speeds. These improvements add materially to the cost of the work, but that added cost is more than offset by the resulting gain in safety and capacity. Changes now planned for New York's Westside Elevated Highway should help it catch up with this progress.

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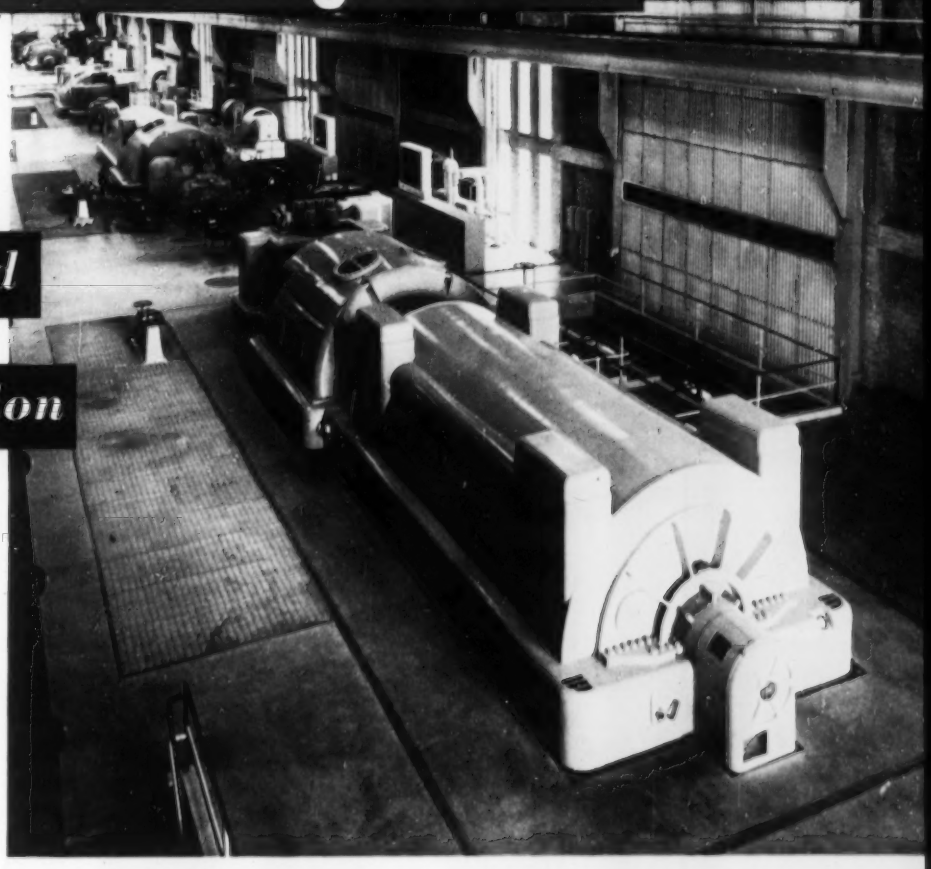

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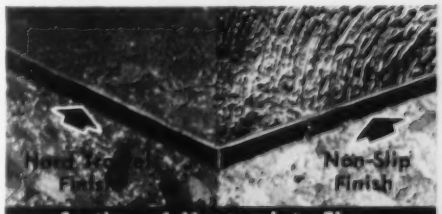

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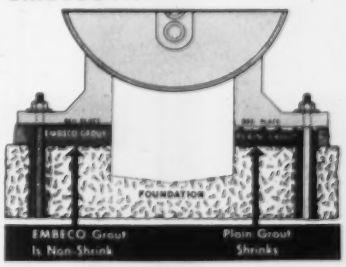

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